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TRENDS IN THE DISTRIBUTION OF EMPLOYMENT BY EMPLOYER SIZE: Recent Canadian Evidence

by

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TRENDS IN THE DISTRIBUTION OF EMPLOYMENT BY EMPLOYER SIZE: Recent Canadian Evidence

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ABSTRACT

A common wisdom developed during the economic expansion of the 1980s that small firms were responsible for most of the net new job creation. The primary goal of this paper is to test that hypothesis using several different data sources: the Census of Manufacturing, the Survey of Employment, Payroll and Hours, and a newly developed longitudinal database on firms. The major findings are: 1) that the percentage of jobs found in small firms did, indeed, increase in the 1980s; 2) that the shift of employment share to small firms occurred throughout the private sector economy, but was more evident in goods producing industries than service sector industries; 3) the increasing importance of service sector employment played a role in the growth of small firm jobs, but was generally less important than shifts in the size distribution within the major industrial sectors; and, 4) from 1983 to 1988 the increasing percentage of small firm jobs had a small negative impact on average earnings.

KEYWORDS

Firm size, employer size, company size, enterprise size, employment, small business, entrepreneur, earnings, job creation, shift share, decomposition.

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I. INTRODUCTION

The 1980s were characterized by a very severe recession early in the decade, followed by a sustained recovery and expansion. This expansion in North America was notably different from earlier periods of growth. While job losses during the recession were concentrated in the goods-producing sector, job creation during the expansion was centred in the service sector -- accelerating the long-term shift of employment to the services. Atypically, unemployment remained high during the expansion, only dropping to its pre-recession level by 1988. Chronic unemployment, formerly a youth problem, was increasingly associated with men over 35. Among the employed, real average wages were almost stagnant through the 1980s. And the shape of the wage distribution was also changing. Net new job creation was apparently concentrated at the bottom and to a lesser extent at the top of the wage scale -- resulting in the much-discussed declining middle phenomenon (see, for example, Myles, Picot and Wannell). Since young people occupied many of the newly-created, low-wage jobs, their average wages plunged in relation to the wages of older workers.

As for the demand side of the labour market, a common wisdom was developing that most of the net job growth in the expansion was generated by small firms. If this conjecture were true, it could account for some of the trends noted on the supply side. Consider the consequences of a rise in small firm employment given the following observations. Smaller firms are disproportionately found in private sector services (Morrisette 1991). Smaller firms are typically younger than their larger counterparts and are more likely to fail in a given year (Baldwin and Gorecki 1989a). Labour turnover rates are higher in smaller firms (Picot and Baldwin 1990). Small firms tend to be less unionized than large firms. On average, the small-firm workforce is younger, less experienced and less educated than the large-firm workforce. As a group, small firms pay lower wages and offer fewer benefits (such as pension

plans) than large firms, even when controlling for such worker characteristics as job tenure, age and education (Morrisette 1991; Brown and Medoff; Evans and Leighton 1989a). Obviously, the size distribution of employment plays an important role in the structure of labour markets.

Other than a flurry of activity in the old Department of Regional Industrial Expansion in the mid-1980s (see Canada 1985 and 1986), very little empirical work on the distribution of Canadian employment by firm size has surfaced. Making use of a couple of recently developed data series, this paper is intended to partially remedy that situation.

The results of this study generally confirm the common wisdom that small firms created the bulk of jobs in the recent expansion. More specifically, the major findings are:

1) the percentage of jobs found in small firms increased from the late 1970s to the late 1980s, but was most evident in the four years following the 1982 recession;

2) the shift of employment share to small firms occurred throughout the private sector economy, but was more pronounced in goods-producing industries than service sector industries;

3) the increasing importance of service sector employment played a role in the growth of small firm jobs, but was generally less important than shifts in the size distribution **within** the major sectors of the economy; and,

4) from 1983 to 1988, the increasing percentage of small firm jobs had a depressing effect on average earnings.

This paper examines the magnitude of the shift of employment share to smaller firms, its intra- and inter-industry components

and its impact on average earnings. The analysis is divided into five sections. The first section covers some of the technical aspects of measuring changes in the distribution of employment by firm size. The next section outlines the magnitude of the shift of job share to smaller firms across all private sector employers. The third section examines shifts within industrial divisions and assesses the importance of these intra-industry shifts versus inter-industry changes in the distribution of employment. The fourth section explores the impact of changes in the employer size distribution on average earnings per worker. The closing discussion covers some of the explanations for the shift of employment share to smaller firms.

II. TECHNICAL CONSIDERATIONS

II.i. Measurement of Employer Size

Employer size is normally measured either by the value of activities (shipments, value added, etc.) or by the number of persons employed. Since the primary concern here is with labour market processes, employer size is expressed in terms of the number of persons employed. The distribution of employment by employer size is summarized by two types of measures in this paper: fixed boundaries and a measure of central tendency.

Fixed boundary measures involve setting ranges of employer size and counting the number of employees (or employers) within each range. In the bulk of previous studies on employer size, a standard set of firm size ranges has evolved defining categories of 1-19, 20-99, 100-499 and 500 or more employees. For comparability to other studies, this study will, in part, follow that convention.

The possibility exists, however, that such broad and arbitrarily defined ranges may not adequately reflect the employer size distribution or capture subtle changes over time. To avoid these pitfalls a second type of fixed boundary method is used extensively in this paper.

This alternative method lets the employer size distribution determine the boundaries. The boundaries for the alternative method are determined by employer size deciles of employment in the starting year of each data series. Thus each of ten ranges contains one-tenth of all employees in the starting year.[1] Future shifts in employment by employer size are signalled by divergences from an even distribution of jobs across categories. The greater

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[1]The percentage of employees in each range may not be exactly ten percent due to numerous employers with boundary levels of employment at the lower end and large employers that span the boundaries at the upper end.

number of categories enables the detection of shifts that may be missed by the standard four-category approach.

This paper also introduces a non-standard measure of central tendency in the employer size distribution: the employee-weighted median (which is abbreviated to **e-median**) employer size. This statistic is calculated simply by ordering employers by size and finding the size of the firm which contains the halfway point in a count of **employees**. This number can be interpreted as the median firm size from the workers' point of view.[2] The simple mean or median employer size is not used since either yields a biased view of the situation of workers and may move in the opposite direction of demonstrable shifts in the distribution of employees by employer size (Davis and Haltiwanger 1989).

Finally, note that all the changes in the employer size distributions, whether in absolute or percentage terms, refer to the **net change** for the period covered (i.e. changes in stock). Is the typical firm size declining? Is the percentage of jobs in very small firms increasing? These are the types of questions addressed in this paper. Note that gross employment flows -- related to firm births, deaths, growth and decline -- may be many times what the net flows suggest (see, for example, Baldwin and Gorecki 1989a, or Baldwin and Picot). Such information can be used to address the issue of how the firm size distribution evolves at the micro level. Since two of the data sources used in this paper contain longitudinal firm data, the author plans to include an analysis of firm dynamics in a future paper.

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[2]Davis and Haltiwanger (1989) uses a coworker (employee-weighted) mean to similar effect.

II. ii. **Organizational Levels**

Employers, as business entities, often operate within hierarchical organizational structures. Employer size must be measured at explicit organizational levels to achieve consistency within and between data sources and over time. Measuring employment separately at the various levels of organization allows for differing trends at each level. Three levels of hierachy can adequately describe most economic activity: establishments, companies and enterprises[3].

Establishments are the basic unit of economic activity: single locations where goods or services are produced or traded. Examples of establishments include: a mine, a manufacturing plant, a retail store, a real estate office and the head office of a multi-branch bank. To statistical agencies, establishments represent the smallest unit for which meaningful input and output measures can be gathered.

Companies are the legal entities through which the economic activities of establishments are represented. Companies may be comprised of a single establishment or many. Company employment totals refer to the sum of employment in all establishments owned by the company. Accordingly, summary measures of the distribution of company size will always be larger than the corresponding measures of establishment size.

Enterprises consist of a company or companies controlled by the same interests. The simplest form of enterprise is the single-establishment company. At the other end of the scale are conglomerates which control many companies (and even more establishments) through complex networks of holding companies and

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[3]For a more complete discussion of these organizational hierarchies see **Concepts and definitions of the census of manufactures**, Statistics Canada Catalogue 31-528, 1979.

intercorporate connections. Enterprise employment is the sum of employment at all the constituent parts.

Most of the analysis in this paper is presented at the company level, as proxied by Statistics Canada's Business Register identifier, since this level was available on all the data files used. Establishment data is presented where possible, since the size of actual producing units may be the driving force behind changes in the size distribution. Enterprise level statistics are not discussed in the paper, but show similar trends to the company and establishment levels in the manufacturing sector[4].

II.iii. **Data Sources**

Employment figures from survey and administrative data sources may not exactly correspond to the hierarchical levels outlined above. Variation from these ideal types can stem from accounting practices, survey reporting requirements, tax law or a number of other factors. These variations may not be not be random and may be confounded by changes in the data gathering mechanism over time. To minimize the possibility of reporting spurious results, several different data sources with overlapping coverages are used in this study. The broadest possible definition of employment available from each source is used maximize comparability.

The **Census of Manufactures** provides the longest consistent data series used in this report. This series consists of establishment-level records covering the years 1970-86. Company- and enterprise-level identifiers on the file enable establishment employment to be rolled up to the higher levels, although these totals will exclude units outside of the manufacturing sector. A full description of this series is available in Baldwin and Gorecki

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[4]Only the Census of Manufacturing files had readily available enterprise identifiers.

(1989b).

Company-level employment **estimates** for all sectors of the economy are available from a longitudinal research data base maintained by the Business and Labour Market Group (see Statistics Canada 1988). This data base -- referred to by the acronym **LEAP** for Longitudinal Employment Analysis Program -- combines information from the Business Register, tax records and the Survey of Employment, Payroll and Hours into longitudinal company records covering the years 1978-1988.

The **Survey of Employment, Payroll and Hours** (SEPH) provides verification of the trends discerned from the other data sources and some indication of the effects of shifting employment patterns on average wages.[5] Initiated in 1983, SEPH is an establishment-level, monthly survey of employers in all sectors. Identifiers also enable employment roll-ups to the company level. SEPH collects information from all larger establishments (generally those with 200 or more employees) and a rotating sample of smaller establishments.[6]

Economic activity is usually classified by industry -- a group of entities producing the same class of good or service. Published industry employment figures are normally aggregated from establishment-level data. Establishments are classified into industry groupings according to the main activity conducted at the establishment. Classifying entities into industries becomes

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[5]The employment figures from the Census of Manufactures and the LEAP database are yearly averages. The SEPH employment figures refer to September of each year to save the expense of calculating the annual average across 12 monthly surveys. September is chosen since seasonal variations in employment are relatively small in this month.

[6]See **Employment, Earnings and Hours**, Statistics Canada Catalogue 72-001, for a full account of the concepts and methods employed by SEPH.

fuzzier as establishments are rolled up to the company level and companies to the enterprise level, since the higher level entities may encompass a broad range of activities. Following standard practice, companies are classified according to the industry of their largest establishment.

The analysis in this paper is restricted to employers in non-agricultural, private sector industries. Public sector industries -- public administration, health, education and welfare -- are not included since different factors affect the employer size distributions in these industries.[7] However, no effort is made to exclude government-owned or -controlled companies operating in private sector industries since they should respond to the market forces in those industries.[8]

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[7]A cursory examination of employer size in the public sector indicated that the trends are substantially different than in the private sector.

[8]The one exception to this rule is Canada Post, which has been excluded from this analysis due to its change in status during the period under study.

III. EMPLOYER SIZE TRENDS: ALL PRIVATE SECTOR INDUSTRIES

During the mid 1980s there was a dramatic shift of employment share from larger to smaller employers in the private sector as a whole. This trend is evident both at the company and establishment levels.

III. i. Company Level Trends

At the company level, LEAP employment estimates indicate that the employee-weighted median (e-median) company size plummeted by about 40% between 1978 and 1988. As is evident in Chart 1, nearly all of this decline occurred between 1981 and 1987 with the steepest drop occurring between 1982 and 1983. Although company-level employment counts from SEPH for 1983-1988 are significantly lower than the corresponding LEAP estimates[9], the time trend is parallel. The SEPH e-median fell by over 40% across this period, beginning with an abrupt drop from 1983 to 1984.

The downward shift in e-median company size reflects a sharp drop in the share of jobs found in businesses with more than 500 employees. According to LEAP estimates, the proportion of workers employed in the largest company size class (500+) fell from 44 percent in 1978 to 39 percent in 1988 (see Chart 2). The share of jobs increased in smaller firms: by 2 percentage points in companies with 1-19 employees, by 2 points in those with 20-99 employees and by 1 point in those with 100-499 employees. Similarly, the SEPH data for 1983 to 1988 show a shift of jobs from larger to smaller companies (Chart 3). Over this 5 year span the share of jobs rose in companies with less than 20 employees and with 20-99 employees, while the share of jobs at larger firms fell.

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[9]The divergence between the LEAP and the SEPH employment figures may be due to an upward bias in the LEAP estimation process or some units in multi-establishment companies may fall outside of the SEPH sample (although efforts are made to prevent this) or some combination of the two.

(Note that over both periods the absolute number of jobs increased in all size classes, but absolute growth did not extend to all size classes in all sectors. Small firm jobs increased in absolute numbers in all sectors. On the other hand, the absolute number of large firm jobs increased in service sector industries but fell in goods-producing industries.)

Defining company size classes according to deciles of employment gives an even clearer picture of the shift of job share to smaller companies. Chart 4 shows that from 1978 to 1988 each of the six smallest LEAP company size categories increased its share of jobs, while the share in the four largest size classes dropped. Since each size class accounted for 10 percent of the jobs in 1978, the bars represent proportionate change. Thus, the share of jobs in the four smallest size groups increased by between 8 and 11 percent, whereas the share of jobs in the largest group fell by 18 percent.

The pattern is somewhat different using decile boundaries calculated in 1983 (as is necessary with the SEPH data), although the shift of jobs to smaller companies remains clear. According to the SEPH data, the combined share of the smallest four 1983 deciles had gained by 4.4 percentage points by 1988 (see Chart 5). Unlike the LEAP figures, there was one pocket of increasing share at larger firms. The share of jobs in the seventh 1983 deciles -- companies with 516-1620 employees -- was up half a percentage point in 1988. However, the share of jobs decreased by at least half a percentage point in the other 5 upper company size ranges.

III.ii. **Establishment Level Trends**

All of the trends described at the company level for 1983-88 can also be found, although somewhat less dramatically, at the establishment level. Between 1983 and 1988, the e-median SEPH reporting unit (establishment) size fell 20% from 99 to 79, with the largest drop occurring between 1983 and 1984 (see Chart 6).

Looking at the four standard size classes, the net growth in jobs was apparently shifting away from establishments with greater than 100 employees to smaller units. Between 1983 and 1988, the share of jobs grew by 2.4 percentage points in the 0-19 size class and by 0.9 percentage points in the 20-99 size class (see Chart 7). The increasing share for smaller establishments came mainly at the expense of units with 100-499 employees, whose share fell by 2.8 percentage points.

Fixed decile boundaries give a sharper image of the shift in job share to smaller establishments. From 1983 to 1988, the share of jobs shifted from the six largest to the four smallest establishment size categories -- that is from units with greater than 54 employees to smaller units (see Chart 8). The greatest gains were in the first two 1983 deciles, representing establishments with less than 15 employees, while the share of jobs dwindled conspicuously in the sixth and seventh deciles (units with 102-338 employees). Clearly, smaller establishments fuelled job creation in the mid 1980s.

In summary, all the evidence presented in this section points to a shift of employment share from larger to smaller employers during the 1980s. This trend was conspicuous at the establishment level and even stronger at the company level. Most of this change was concentrated between the years 1982 and 1984, a period in which the economy was climbing out of a deep recession. Since not all sectors of the economy were equally affected by the recession, the following section examines the role of both intra- and inter-sectoral shifts in the distribution of jobs by employer size.

IV. SMALLER EMPLOYERS: A CONSEQUENCE OF THE "SERVICE ECONOMY"?

In the past 30 years net job creation in the service sector outpaced the growth in goods-producing industries resulting in a steady rise in the share of jobs found in the service sector (Picot 1986). This trend accelerated with the 1981-82 recession as job losses were far more severe in the goods-producing sector than in the service sector. Since employers in the service sector are typically much smaller than employers in goods-producing industries[10], one might expect that a quickening of the shift to the services might adequately explain the drops in employer size outlined in the previous section.

In fact, the shift to the services is only part of the story. In this section, we demonstrate first that the shift of jobs to smaller employers occurred in all major sectors of the economy. Secondly, we show that these within-sector shifts to smaller employers are, on average, more important to the overall trend than inter-sectoral shifts in the distribution of jobs.

IV.i. Employer Size Trends: Goods-Producing Industries

Trends in employment by employer size in the goods-producing sector were similar to the trends in the overall economy -- employment share shifted from larger to smaller firms, particularly in the period from 1981-1987. The shift to smaller firms crossed all the major goods-producing sectors -- natural resources, manufacturing and construction -- and occurred in nearly all manufacturing subsectors. Towards the late 1980s the trend was less consistent. While the typical employer size continued to fall

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[10]For example, e-median company and establishment size was about three times greater in manufacturing than in private sector services in 1988.

in some industries, it had leveled off or even increased in others -- though rarely to pre-recession levels.

All Goods-Producing Industries

Between 1978 and 1988, the e-median company size in the goods-producing sector fell by 37% according to LEAP employment estimates (see Chart 9.). The drop in company size was even greater, at 40 percent, if measured from the e-median peak in 1981. The shift of jobs to smaller firms was especially strong between 1982 and 1987, with the conspicuous exception of an e-median plateau between 1983 and 1984. The corresponding SEPH data actually show a sharp rise in the e-median from 1983 to 1984, and subsequent declines from that year on (see Chart 10).

Naturally, the drop in the e-median company size in the goods-producing sector signalled an increase in the share of jobs in the smaller company size categories. LEAP employment estimates show that the share of jobs in companies with more than 500 employees fell by 6 percentage points with most of the gains going to firms with less than 100 employees (see Chart 11). Fixed decile boundaries for the same period portray a shift from the four largest to the six smallest firm size categories (see Chart 12). The greatest change occurred at the extreme ends of the distribution: the share of jobs in the top 1978 decile plummetted 30 percent while the share in the bottom jumped 24%. This shift to smaller employers is echoed in most subgroups of the goods-producing sector.

Manufacturing Industries

Since manufacturing accounts for more than half of all goods-producing jobs, it is not surprising that employer size trends in manufacturing resemble the overall trends for the sector. While the shift of employment to smaller employers was somewhat less dramatic in manufacturing, it was substantial none the less. The LEAP e-median company size in manufacturing fell by 26% between

1978 and 1988 (see Chart 13). The drop in e-median manufacturer size persisted from 1981 to 1987, interrupted only by a one-year upswing in 1984. Census of Manufacturing and SEPH data verify both the downward trend and the temporary upswing in manufacturing company size.

The decline in the typical manufacturing company size is largely attributable to strong net job creation in firms with less than 500 employees. Between 1978 and 1988 the share of jobs in manufacturers with less than 20 employees grew from 8.6 percent to 10.1 percent, from 17.8 to 19.9 percent in those with 20-99 employees and from 23.5 to 24.1 percent in the 100-499 category (see Chart 14). Meanwhile, the share of jobs in manufacturers with 500 or more employees fell by 4.2 percentage points. The 1978 company size deciles add some nuances to this apparently straightforward picture. While the greatest increase in job share occurred in the bottom three 1978 deciles (firms with 130 or fewer employees), there was also growth in the middle of distribution -- the fifth and sixth deciles (see Chart 15). Declines in job share were greatest in the seventh through ninth deciles (firms with 1938-6017 employees), but the share in the fourth decile also fell slightly. The share of jobs in the top category (6018 or more employees) was the same in 1978 and 1988. Despite these nuances the overall result remains clear: 4 percentage points of job share shifted from the top half to the bottom half of the 1978 company size distribution.

The shift of jobs to smaller employers was notable in almost all manufacturing subsectors. Between 1978 and 1986, the e-median establishment size fell in 9 of 11 industry divisions.[11] While the

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[11]Establishment size is used at this finer level of detail, since companies may operate establishments that fall into several industrial groupings. Industries were aggregated into these 11 groups according to similarity of product, average establishment size and similarity of employment trends across the period under

typical establishment size increased slightly in Food and Tobacco Products (+5%) and Clothing (+2%), the e-median fell sharply in a number of industries -- by over 20% in 6 groups (see Charts 16a, 16b, & 16c). Thus, the shift of job share to smaller companies was widespread in the manufacturing sector.

Natural Resource Industries

The drop in the e-median company size was even more dramatic in the natural resource sector (comprised of Forestry, Mining and Fishing) than in manufacturing. The typical natural resource company size fell 39% between 1978 and 1988, a period which includes an even steeper plunge of 48% from the e-median peak in 1981 to its low in 1988 (see Chart 17). Note that employment in the natural resource sector remains skewed towards larger employers despite the ongoing shift of job share to smaller companies.

Construction

In contrast, construction is an industry characterized by small companies. While the typical construction company is only a fraction of the size of its natural resource counterpart, the construction e-median followed a similar trend from 1978 to 1986 (see Chart 18). It climbed to a small peak in 1982 and nosedived to a low point in 1986. Then, unlike manufacturing or natural resources, the construction e-median made a u-turn, punctuated with a sharp jump from 1987 to 1988. Still, the 1988 e-median remained 17% below the 1978 level.

In summary, the shift of job share to smaller employers in the 1980s occurred throughout the goods-producing sector. In relative terms, this shift was strongest in the natural resource sector and weakest in construction. The movement to smaller employers is also evident in nearly all the manufacturing subsectors examined. Given the depth and breadth of this shift of jobs to smaller firms in the

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study.

goods-producing sector, the economy-wide employer size trend cannot be solely attributed to service sector growth.

IV.ii. Employer Size Trends: Private Sector Services

Just as in the goods-producing sector, service sector employment share shifted to smaller firms during the 1980s. However, the changes in the shape of the sevice sector employer size distribution were somewhat different. Here the trend could be best characterized as a shift of jobs from large- to medium-size companies. Furthermore, there was less agreement between alternate data sources on the company size trends in the private sector services.

All Private Sector Services

Between 1978 and 1988, the employee-weighted median company size fell by 17 percent in the private sector services according to LEAP estimates. The e-median did not follow a steady downward course over this period. Starting at 136 in 1978, it quickly peaked at 151 the following year, then fell each year until 1987 and ended with an upturn in 1988 (see Chart 19). The SEPH data for the years 1983-88 show a somewhat different pattern -- a large drop from 1983 to 1984 and little change thereafter (see Chart 20).

Although a drop in the e-median indicates a net share increase in the bottom half of the service sector size distribution, fixed boundary measures show that the net gains were concentrated closer to the middle, rather than the very bottom, of the distribution. In fact, from 1978 to 1988 the LEAP estimates display a net loss in the share of jobs in service sector companies with fewer than 20 employees (see Chart 21). Net share increases were concentrated in the middle two size groups (firms with 20-499 employees), whose gains came mainly at the expense of firms with over 500 employees. The 1978 fixed decile boundaries confirm this pattern. The share of jobs increased in the third through seventh size classes

(representing companies with 23-2010 employees), while falling in the bottom two and top three categories (see Chart 22). Thus, from 1978 to 1988, net job growth in the service sector was concentrated in the middle of the firm size spectrum, while the share of jobs in very large firms dropped sharply.

Service Sub-sectors

Despite the diversity of the service industries, the shift of jobs to medium size firms was consistent throughout the sector. In each of the three subsectors examined -- Distributive Services, Consumer Services and Business and Financial Services[12] -- firms with between 20 and 499 employees grew faster than larger or smaller companies. Between 1978 and 1988, the share of jobs in this middle size range increased by about five percentage points in each subsector (see Chart 23). In Distributive Services and Business and Financial Services middle-sized firms gained share mainly at the expense of larger firms, while in Consumer Services the net shift out of large and small firms was about equal.

The shift to medium-sized employers was accompanied by a drop in the employee-weighted median company size in two of the three service subsectors. From 1978 to 1988, the e-median dropped by 39 percent in Business and Financial Services and by 30% in Distributive Services (see Chart 24). The typical company size in Consumer Services was the same in 1988 as 1978, but this comparison of the endpoints masks relatively large movements in the intervening period. In fact, net of increases in the e-median from 1978 to 1979 and 1987 to 1988, the main trend in Consumer Services company size was a drop in the early 1980s.

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[12]Distributive Services include transportation, communications, utilities and wholesale trade. Consumer Services include retail trade, personal services, amusement and recreation services, accomodation and food services, and miscellaneous services. Business and Financial Services include finance industries, insurance carriers, insurance and real estate agencies and services to business management.

Rebasing the LEAP employer size distributions to 1983 enables comparisons to SEPH data. The LEAP data for 1983 to 1988 show basically the same pattern as they did for 1978 to 1988 -- a net shift of employment share into medium size employers. On the other hand the SEPH data for 1983 to 1988 show more of a shift from large to small employers. Across the private services sector, LEAP data show a net gain of five percentage points in the two middle company size classes (20-99 and 100-499 employees) and net losses in smaller and larger companies (see Chart 25). For the same 1983-1988 period, SEPH data demonstrate growth in job share in the two smaller size categories at the expense of larger firms. These general patterns held true within the service subsectors (see Chart 26.), with the exception of Business and Financial Services. The SEPH data for that sector show a shift in job share from firms with 1-19 employees to those with 20-100 employees, with larger firms retaining their share.

In summary, the typical company size in the private services sector contracted from the late 1970s to the late 1980s, but the trend was not as widespread or as strong as it was in the goods-producing sector. Evidence on the concentration of net job growth was mixed in the service sector. One data source pointed to relatively strong net job creation in medium-size firms, while the other indicated that job growth was centred in medium-to-small size companies. Despite these differences, no data source or subsector indicated a shift of employment share to large companies.

While employment share has shifted from larger to smaller (or medium size) companies in all sectors examined, this is potentially just one component of the economy-wide shift to smaller employers. The other component is inter-industry differences in rates of net job creation.

IV.iii. **The Role of Inter-Industry Employment Shifts**

Even though employment shifts from larger to generally smaller companies have been demonstrated in the each of the major industrial sectors, inter-sectoral shifts may also play an important role in the growth of small-firm employment. If, for example, the rate of employment growth in sectors with typically small companies outpaced growth in typically large-company sectors, overall job shares would shift to small companies -- even if the within-sector distributions retained the same shape. Accordingly, this section first examines whether the rate of net job growth was greater in sectors with typically smaller firms. Secondly, the relative importance of inter-sectoral shifts to the economy-wide trend is assessed by means of a shift share analysis.

If employment is growing faster in industries with smaller companies, then employment growth should be negatively correlated with industries' typical company size. The LEAP data point to a strong negative correlation between the 1978 industry e-median company size and employment growth between 1978 and 1988 (see Table 1.). The notion of a shift of job share from larger goods-producing firms to smaller service-producing firms holds true in a broad sense, but with some notable exceptions. Construction -- a goods-producing industry -- had the smallest typcial company size in 1978 and the greatest growth in employment between 1978 and 1988. Distributive Services is comprised of relatively large firms and grew slowly over the decade. On the whole though, employment share was generally shifting from large firm to small firm sectors and from the goods-producing to the service sector.

The shift of jobs to sectors with smaller firms, however, plays only a supporting role in the economy-wide shift to smaller employers. A simple model of the changing firm size distribution can be constructed which weighs the relative importance of within-industry shifts in the employer size distribution against inter-industry shifts in employment shares. In this model, the change in

employment share within an employer size range can be mathematically decomposed into 1) a component representing the changes in that size range within each industry group (within-industry component); 2) a component representing shifts in employment shares among industry groups (among-industry component); and, a usually small component representing simultaneous changes in the first two components (interaction term). The algebraic formula and the logic for this **shift share analysis** are outlined in Appendix I.

A shift share analysis of the 1978 to 1988 change in LEAP fixed decile company size ranges by major industry sector shows the within industry component to be generally more important than the among-industry component. Although among-industry shifts accounted for most of the growth in the smallest two company size groups, within-industry shifts accounted for the majority of the change in seven of the eight remaining size ranges (see Table 2). Averaged across all size ranges, 64 percent of the change in the company size distribution was due to within-industry shifts, 33 percent was due to among-industry differences in growth rates and 3 percent fell onto the interaction term.

This shift share analysis leads to a richer interpretation of the changes in the employer size distribution between 1978 and 1988. The increased share of jobs in very small companies was mainly a consequence of rapid employment growth in sectors with typically small firms, notably Construction and Consumers Services. Gains in employment shares in medium-size companies came mainly at the expense of losses in job share at large companies within the same industry. The shift of job shares from very large to medium size firms was particularly strong within the sectors made up of typically large companies -- Natural Resource and Related Industries, Distributive Services, Business and Financial Services and Manufacturing.

Thus the economy-wide shift of jobs to smaller employers was a consequence of greater net job creation in small-company sectors and, more importantly, a decrease in the typical company size within almost all sectors. Since small companies generally pay lower wages than larger companies, the following section looks at the possibility that the shift of jobs to smaller employers has had a depressing effect on average labour earnings.

V. AVERAGE EARNINGS AND THE SHIFT OF JOBS TO SMALLER EMPLOYERS

That small firms pay lower wages, on average, than large firms is a well-established finding. Most empirical studies of the issue have also found that a large-firm premium persists after controlling for measurable differences in workforce quality (see, for example, Evans and Leighton; Brown and Medoff; or Morissette). If this firm-size wage gap remains constant over time, then obviously a shift in employment share from large to small firms will lower the average wage across the economy. The extent of this phenomena can be demonstrated using the SEPH data for 1983-88.

SEPH enables average weekly earnings to be calculated at the establishment or company level[13]. Results are presented here at the company level, but are essentially the same at the establishment level. Looking at fixed deciles of 1983 company size, note that average weekly earnings rise with almost each increase in company size (Table 3). This relationship forms the basis for a decomposition of the change in average earnings.

Just as the shift of employment to smaller firms could be decomposed into two components and an interaction term, so too can the change in average weekly earnings. The first component, the firm size effect, addresses the hypothetical question, "If these earnings were to remain constant over time, what effect would a change in the distribution among size classes have on the overall average earnings?". The second component is the effect of changes in the average earnings within size groups -- the size distribution is held constant and average earnings (in constant dollars) are

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[13]The average weekly earnings at an establishment or company is calculated as the sum of wages, salaries and other types of payments to workers divided by the total number of workers. Overtime pay is not included in the calculations. The average earnings across all firms or companies is adjusted by the sample weights.

allowed to vary. The third, usually small, component represents the simultaneous effects of changes in the size distribution and changes in average wages within size groups. Details of the methodology are outlined in Appendix I.

Looking first at the firm size effect, the shift of job share to smaller firms pulled average private sector earnings down by $5.71 per week or 1.5 percent between 1983 and 1988 (see Table 3). Since the shift to smaller employers was stronger in the goods-producing sector than the service sector, the negative impact on earnings was also somewhat stronger in the goods-producing sector. First note that average earnings are much higher in the goods-producing sector than in the service sector -- $472 compared to $321 in 1983 (see Tables 4 & 5). From these 1983 bases through to 1988, the shift to smaller firms pulled the goods-producing average down by $7.38 (1.6 percent) and the service sector average down by $3.50 (1.1 percent). Thus, the shift of employment to smaller firms had the expected negative impact on average earnings in both the major sectors of the economy.

However, an overall downward drift in average earnings within size classes (the earnings component) had an even greater negative effect. Between 1983 and 1988 average earnings fell in 8 of the 10 size classes. As a result, the earnings component had a negative effect of $10.06 (-2.6 percent) on private sector average earnings (see Table 3). The overall earnings effect, however, masks great differences between earnings trends in the goods-producing and service sectors.

While within-group earnings change had a strong negative impact on average earnings in the service sector, it had a weak but positive effect in the goods-producing sector. Average earnings fell in 8 of the 10 size categories in the service sector, with particularly steep drops in the eighth and tenth firm-size deciles (see Table 5). The net effect across all groups was to push

average service sector earnings down by a further 4.2 percent ($13.64). On the other hand, average earnings increased in half of the size groups in the goods-producing sector and decreased in the other half. Across the whole sector the net effect was $3.66 to the positive (0.8 percent), compensating for about half of the negative effect of the shift to smaller firms in that sector.

Though normally small compared to the other two terms, the interaction term signifies whether net job creation is centred in size classes where average earnings are growing or declining. Here again, the service sector contrasts with the goods-producing sector. In the service sector the interaction term was relatively weak and positive (65 cents or 0.2 percent), mainly reflecting a a movement of job share away from the largest size class where real earnings fell the most. Thus a simultaneous shift of jobs to smaller service sector firms and a narrowing of the small-to-large firm pay gap had a weak but positive effect on service sector earnings. On the other hand, average earnings in the largest goods-producing firms increased sharply even as the share of jobs fell dramatically. The concurrent growth of the large firm premium and the shift of jobs to smaller firms, pulled the average earnings in the goods-producing sector down by $1.79 (0.4 percent).

Overall then, the increase in the percentage of jobs in small firms between 1983 and 1988 pulled private sector average earnings downwards. The negative impact on earnings was greatest in the goods-producing sector, where the shift to smaller firms was stronger. In the service sector, however, the modest negative effect of the shift to small employers was exacerbated by a drop in real average earnings within most size classes. In contrast, this real average earnings effect was positive in the goods-producing sector, counteracting about half of the negative impact of the shift to smaller employers. The interaction between the employer size effect and the real earnings effect is usually small, but interesting none the less. In the service sector the earnings gap

between large and small firms was diminishing, which combined with the shift to small firms to create a positive interaction effect. Meanwhile the firm-size earnings gap was widening in the goods-producing sector, creating a negative interaction effect.

VI. DISCUSSION

The purpose of this paper has been to examine recent changes in the distribution of employment by employer size and assess the potential impact of these changes on average labour earnings. The results, for the most part, are strong and unambiguous. The major findings are:

1) in the 1980s, small employers created new jobs at a greater rate than large employers thus increasing the share of employment in small establishments and companies;

2) the shift of employment share to smaller firms occurred in all major sectors of the economy, but was more pronounced in goods-producing industries than service sector industries;

3) the increasing percentage of jobs in the service sector with its typically smaller employers also played a role in the growth of small firm jobs, but was -- on average -- less important than intra-industry shifts; and,

4) the increasing percentage of small-employer jobs had a depressing effect on earnings, pulling average earnings per employee down by 1.5 percent between 1983 and 1988.

These results point to a continuation of the shift of jobs to smaller enterprises reported by the Department of Regional Industrial Expansion (1985, 1986) using Dun and Bradstreet data and by Baldwin and Gorecki (1990) using LEAP data. Similar shifts of jobs to small or mid-size employers in the United States have been noted by Davis and Haltiwanger (1989) and Brynjolfsson et al. (1989). Brynjolfsson et al. also cite evidence presented by Huppes showing recent declines in typical firm size in the United States, the United Kingdom, the Netherlands and the Federal Republic of Germany. To this list, the OECD (1987) would add Australia,

Austria, Finland, France and Luxembourg. Clearly the shift of jobs to smaller employers is a widespread and well-documented trend, but what is driving this phenomenon?

Some recent work has concentrated on structural explanations favouring a shift to smaller emloyers. Much of this work generally follows the "post-industrial" interpretation of recent economic history (Brynjolfsson et al.). New technologies and economic relationships, it is argued, favour smaller units of organization. New production technologies, for example, may reduce economies of scale, giving smaller units the ability to produce as efficiently as larger units. Reduced scale economies reinforce consumer demand for more heterogeneous products, eroding one cornerstone of mass production. Furthermore, information technology is seen to reduce large firms' reliance on internal channels of supply by facilitating the use of external markets. Thus, many goods and services that large organizations produced internally can now be purchased efficiently and reliably from external sources. Brynjolfsson et al., for example, found a strong relationship between rising information technology stock and falling firm size.

Another class of explanations relates small firm job growth to a rise in entrepreneurship in the 1980s. David Foot (in Stoffman) presents a hardship angle on the rise in self-employment. In this argument, upwardly-mobile baby boomers are turning to self-employment in response to clogged career paths and relatively low earnings. Another explanation relies upon the positive relationship between assets and self-employment (see Evans and Leighton 1989). Thus asset growth in the 1980s, fuelled by bull security markets and localized real estate booms, may have contributed to higher rates of entrepreneurship in particular groups. The main problem in assessing these arguments is that the links between entrepreneur characteristics and actual job creation are empirically very difficult to establish.

It is also possible that public policies contributed to the small firm employment boom of the 1980s. Public policies can affect small firm employment directly or indirectly. Examples of policies with direct effects include wage subsidies for newly created small firm jobs or tax credits based on job creation. Indirect effects could result from any policy that reduces the costs of small firms relative to large firms. Some examples include: lower nominal tax rates for small firms, seed capital and financing assistance for small firms, and policies to reduce the regulatory and/or paperwork burden on small firms. A detailed inventory and assessment of all the relevant policies is beyond the scope of this discussion. It is unlikely, however, that public policy initiatives would be of sufficient size and duration to account for more than a small part of the changes to the employer size distribution outlined in this paper. The most plausible explanations are related to the great cyclical variations experienced in the 1980s.

Cyclical interpretations of changes in the firm size distribution of employment are intertwined with recent advances in the understanding of firm employment dynamics. In general, research into firm dynamics has found that employment changes in large firms are generated by firm growth and decline, while employment changes in small firms are largely the result of births and deaths (Baldwin and Gorecki 1989; Birch 1981; Leonard 1986). This by itself does not necessarily favour pro- or counter-cyclical changes in the share of jobs in small firms.[14] In a recession, for example, employment losses through contraction in large firms may be proportionate to losses due to an increase in deaths among small firms, thereby resulting in no change to the distribution. However, several features of the 1981-82 recession may have pushed

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[14]Granovetter (1984) recounts a "dual economy" argument in which large powerful firms tranfer risk to smaller firms, resulting in more small firm job loss in recession and job growth in expansion.

the balance in favour of disproportionate small firm job creation.

First, the recession had a deeper and longer-lasting effect on the goods-producing sector than the service sector. Employment fell further and recovered more slowly in the goods-producing sector than the service sector, accelerating the long term shift of employment share to the services. Since service sector firms are typically smaller than goods-producing firms, the shift to the services has a negative effect on typical firm size. As discussed in Section IV., this effect accounts for up to a third of the shift of jobs to smaller firms. The other two-thirds requires explanations that can account for the shift of employment shares within industries. Labour force demographics and relative wages offer a plausible explanation.

The 1981-82 recession coincided with the baby boomers' early years in the labour market. This large cohort and the smaller group that followed them into the labour market were disproportionately burdened by the recession's unemployment. Evidently, the level of unemployment was high enough among the young to substantially reduce their wages relative older workers. Thus the wage gap between young and old workers increased sharply in the aftermath of the recession (Myles, Picot and Wannell 1988). But how does this favour small firm employment growth?

Research has shown that small firms rely more upon young workers than their larger counterparts (Morrisette 1991). Moreover, since turnover is greater among small firms and the average worker tenure lower, a greater proportion of small firm workers will be recent hires. Thus small firms might have gained a labour cost advantage over large firms through their greater

ability to utilize young, low-wage workers.[15] This could influence small firms to rely more on labour growth and large firms on capital growth to increase production in the expansion that followed the recession. The Census of Manufactures provides strong evidence of a sharp decrease in relative earnings at small manufacturing establishments beginning in 1982 (see Chart 27).

The situation in the service sector was quite different. SEPH data indicate that the wage gap between large and small service sector employers narrowed between 1983 and 1988. Remember though that real earnings fell among most size groups in the service sector. Apparently, large service sector firms may have been able to utilize cheap youth labour more than (and/or less able to make productivity gains than) large goods-producing firms. This may partially explain why the shift to smaller firms was not as pronounced in the service sector.

In conclusion, a number of factors may have contributed to the observed increase of the share of jobs found in small firms. While the timing and structure of this trend circumstantially favour cyclical explanations, the longitudinal data bases used in this report enable fuller assessments of the competing hypotheses. The obvious starting point would be to examine the gross flows that underlie the net changes outlined in this paper.

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[15]The wage advantage of smaller firms may be enhanced by greater wage rigidities in large firms. For example, large firms are more highly unionized and, on average, provide more non-wage benefits than small firms.

APPENDIX I. SHIFT SHARE AND DECOMPOSITION METHODOLOGY

i. Shift Share Analysis

Shift share analysis is an algebraic technique used to describe the relative importance of simultaneous changes to two or more of a population's attributes. In this paper, the population under study is comprised of non-agricultural, private sector employed workers. The two attributes of interest are the distributions of employment by employer size and by industry. The issue we wish to address with the technique is the extent to which the increase in small-employer jobs is related to rising employment in industries where small companies predominate. More formally, how much of the change in the employer size distribution can be attributed to changes in the industrial distribution of employment, as opposed to changes in the employer size distribution within each industry.

The proportion of the population employed in each employer size class is given as

$$F_s = \frac{E_s}{\sum_1^S E_s}$$

where E_s is employment within each size class **s**. Similarly, the proportion of the population employed in each industry is given as

$$P_i = \frac{E_i}{\sum_1^I E_i}$$

where E_i is employment in each industry. Finally, the proportion of jobs in each size class <u>within</u> an industry is given as

$$W_{is} = \frac{E_{is}}{\sum_{1}^{S} E_{is}}$$

where E_{is} is employment within a size class within an industry. The difference in the proportion of employment in any size class **s** between two timepoints **t** and **t+1** can then be written as

$$F_{st+1} - F_{st} = \sum_{1}^{I} P_{sit+1} W_{sit+1} - \sum_{1}^{I} P_{sit} W_{sit}$$

The shift share technique is based on holding the year **t** distribution of each variable constant while allowing the other to vary. Thus changes in each distribution must be isolated and the necessary terms added to balance the right hand side of the equation:

$$\sum_{1}^{I} (P_{sit+1} - P_{sit})(W_{sit+1} - W_{sit}) - [-\sum_{1}^{I} P_{sit} W_{sit+1} - \sum_{1}^{I} P_{sit+1} W_{sit} + 2\sum_{1}^{I} P_{sit} W_{sit}]$$

By expanding, rearranging and collecting terms, the change in the proportion of employment in each size class can be expressed as the sum of three components

$$\sum_{1}^{I} P_{sit}(W_{sit+1} - W_{sit}) + \sum_{1}^{I} (P_{sit+1} - P_{sit}) W_{sit} + \sum_{1}^{I} (P_{sit+1} - P_{sit})(W_{sit+1} - W_{sit})$$

A **B** **C**

Component **A** represents the portion of size class changes related to changes in the distribution of employment by firm size within industries -- the industry distribution is held constant while the firm size distribution within industries is allowed to change.

Component **B** represents the portion of size class changes related to changes in the industrial distribution of employment -- the firm size distribution within industries is held constant while

the distribution of employment across industries is allowed to vary.

Component **C** is represents the effect of simultaneous changes to the across-industry distribution and the firm-size within industry distribution. This interaction term is usually quite small compared to the other two components.

Note that the use of algebraic identities in the shift share technique tacitly implies that all of the intertemporal variation in the firm size distribution can be explained by these three components and that the firm size and industry effects are independent of one another. Of course, many factors influence the changing firm size distribution and all may be, to some extent, interdependent. Accordingly, the decomposition results presented in this paper are best interpreted as a strong (yet incomplete) counter argument to the proposition that downward shifts in the firm size distribution are mainly the result of the ongoing shift to the services (or industries with typically smaller firms).

ii. Decomposition

The decomposition technique is algebraically and intuitionally very similar to the shift share technique. Its purpose in this paper is to determine whether the downward shift in the firm size distribution might have had a negative impact on average earnings.

Decomposition is based on the algebraic relationship between group means and subgroup means -- the group mean is the weighted sum of its constituent subgroup means. In our example, the mean earnings of all workers is the weighted sum of the mean earnings within each size class, where the weight is the proportion of all workers within a particular size class. This relationship is written as

$$\overline{W} = \sum_{1}^{S} \overline{W_s} P_s$$

where P_s is the proportion of all workers in firm size class **s**. Thus the change in average earnings between two periods **t** and **t+1** is expressed as

$$\overline{W_{t+1}} - \overline{W_t} = \sum_{1}^{S} \overline{W_{st+1}} P_{st+1} - \sum_{1}^{S} \overline{W_{st}} - P_{st}$$

Using the derivation outlined for the shift share technique, the change in average earnings can be split into three components

$$\sum_{1}^{S} \overline{W_{st}} (P_{st+1} - P_{st}) \quad + \quad \sum_{1}^{S} P_{st} (\overline{W_{st+1}} - \overline{W_{st}}) \quad + \quad \sum_{1}^{S} (\overline{W_{st+1}} - \overline{W_{st}}) (P_{st+1} - P_{st})$$

A **B** **C**

Component **A** represents the change in mean earnings related changes in the firm size distribution of employment -- average earnings by size class are held constant while the distribution across size classes is allowed to change.

Component **B** represents the change in mean earnings related to changes in average earnings within firm size classes -- the starting distribution is held constant while within-class earnings are allowed to change.

Component **C** is the interaction term, representing simultaneous change in average earnings within size classes and the distribution of employment across size classes.

As with the shift share analysis, decomposition imposes some rigid tacit assumptions -- namely that earnings are independent of and solely determined by firm size class. Recognizing these

shortcomings, the decompositions presented in this paper show simply that the shift to smaller firms has had a depressing effect on average earnings even accounting for some shrinkage of the small firm to large firm earnings gap.

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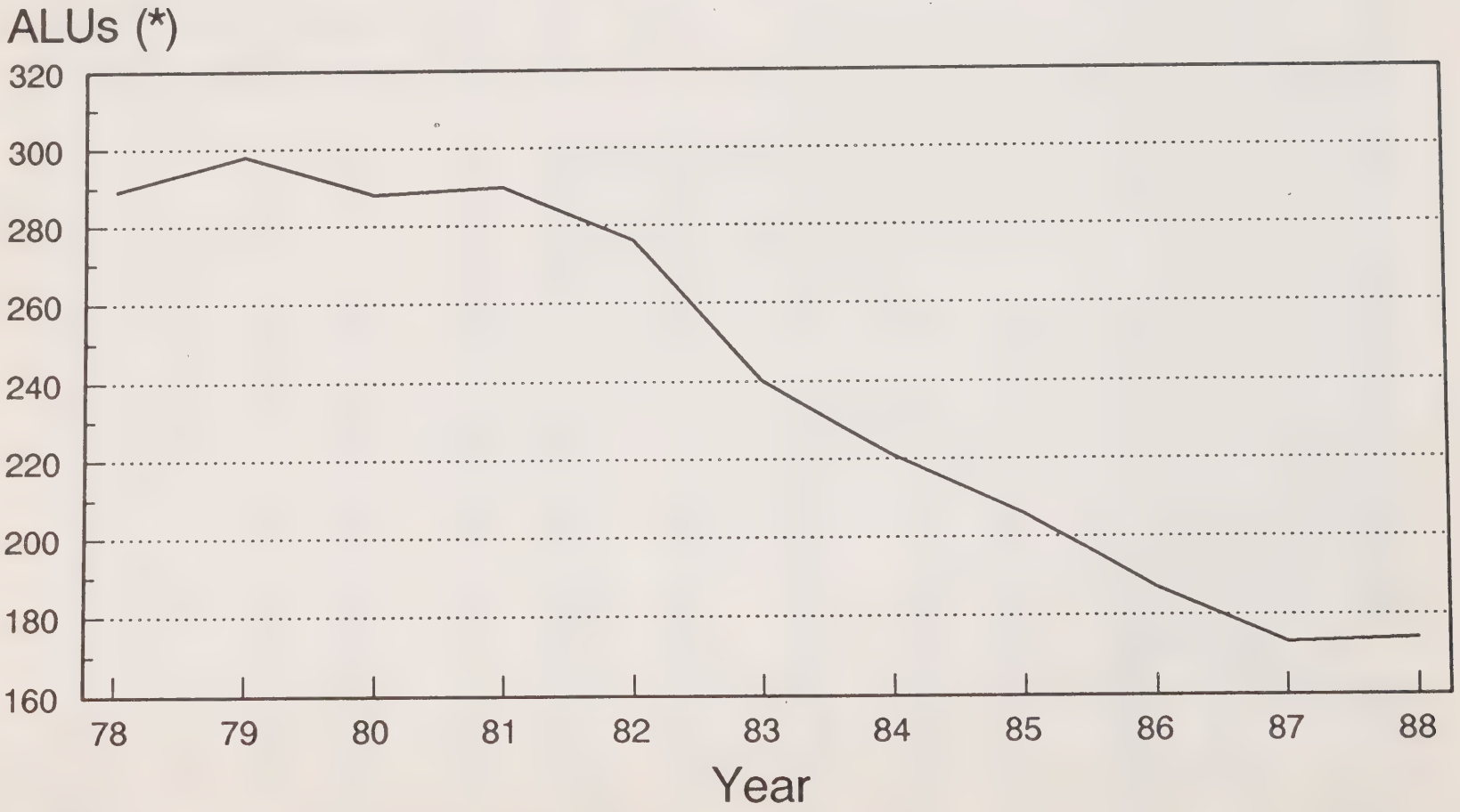
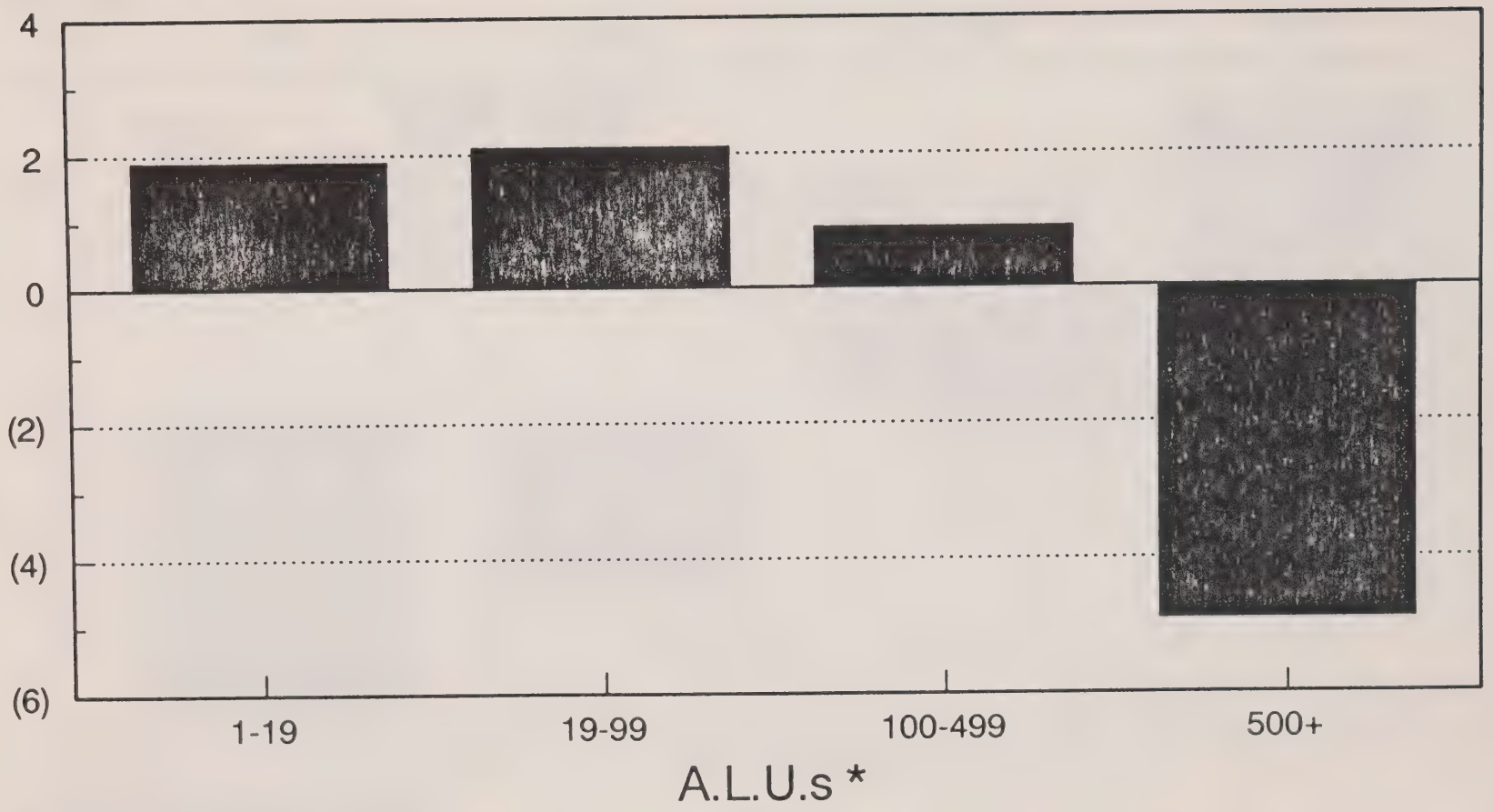
CHART 1. EMPLOYEE-WEIGHTED MEDIAN BUSINESS SIZE ALL PRIVATE SECTOR EMPLOYERS



Source: LEAP database.

* - estimated number of employees based on payroll and industry.

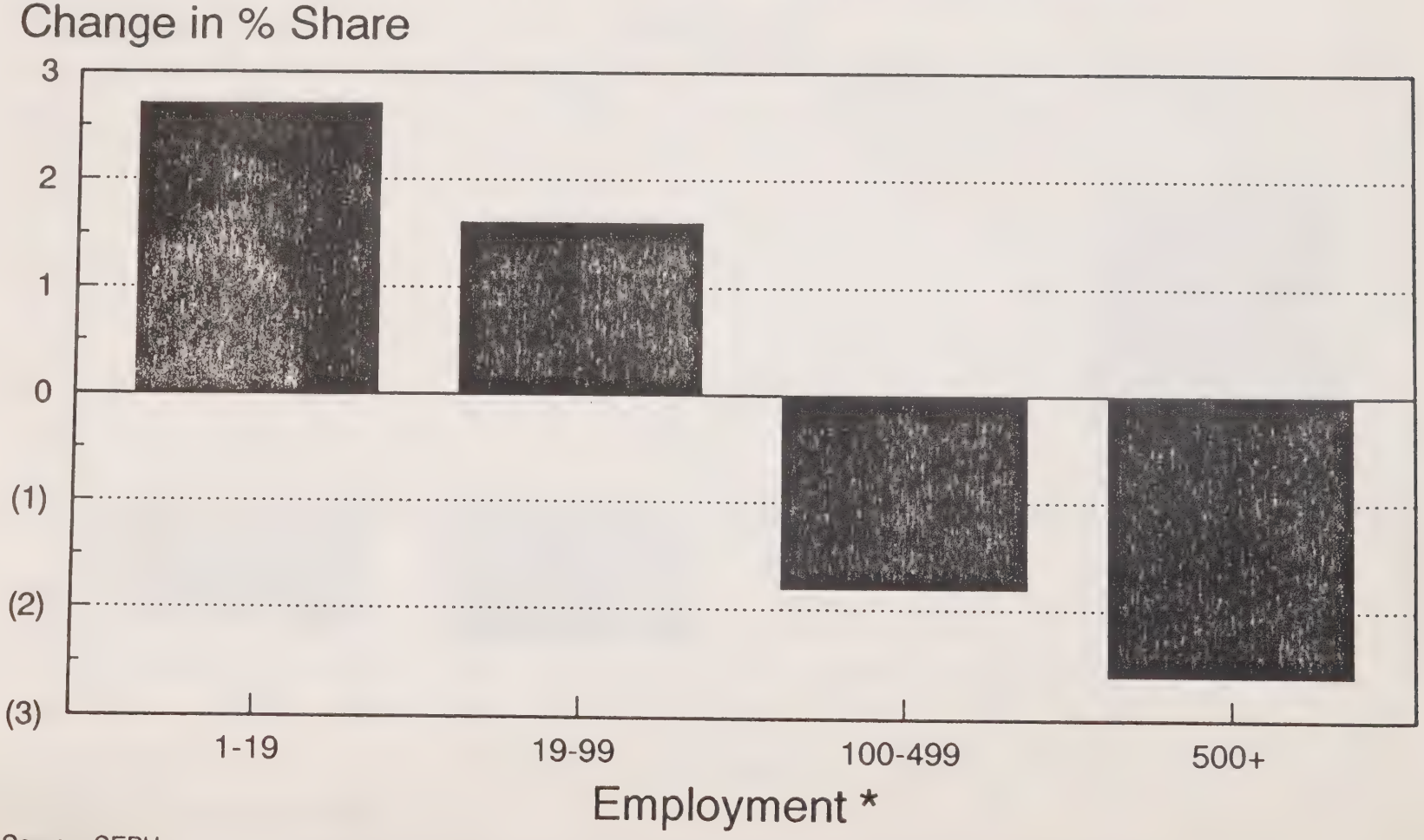
CHART 2. CHANGE IN THE DISTRIBUTION OF PRIVATE SECTOR EMPLOYMENT, BY COMPANY SIZE, 1978-88



Source: LEAP.

(*) Estimated annual employment.

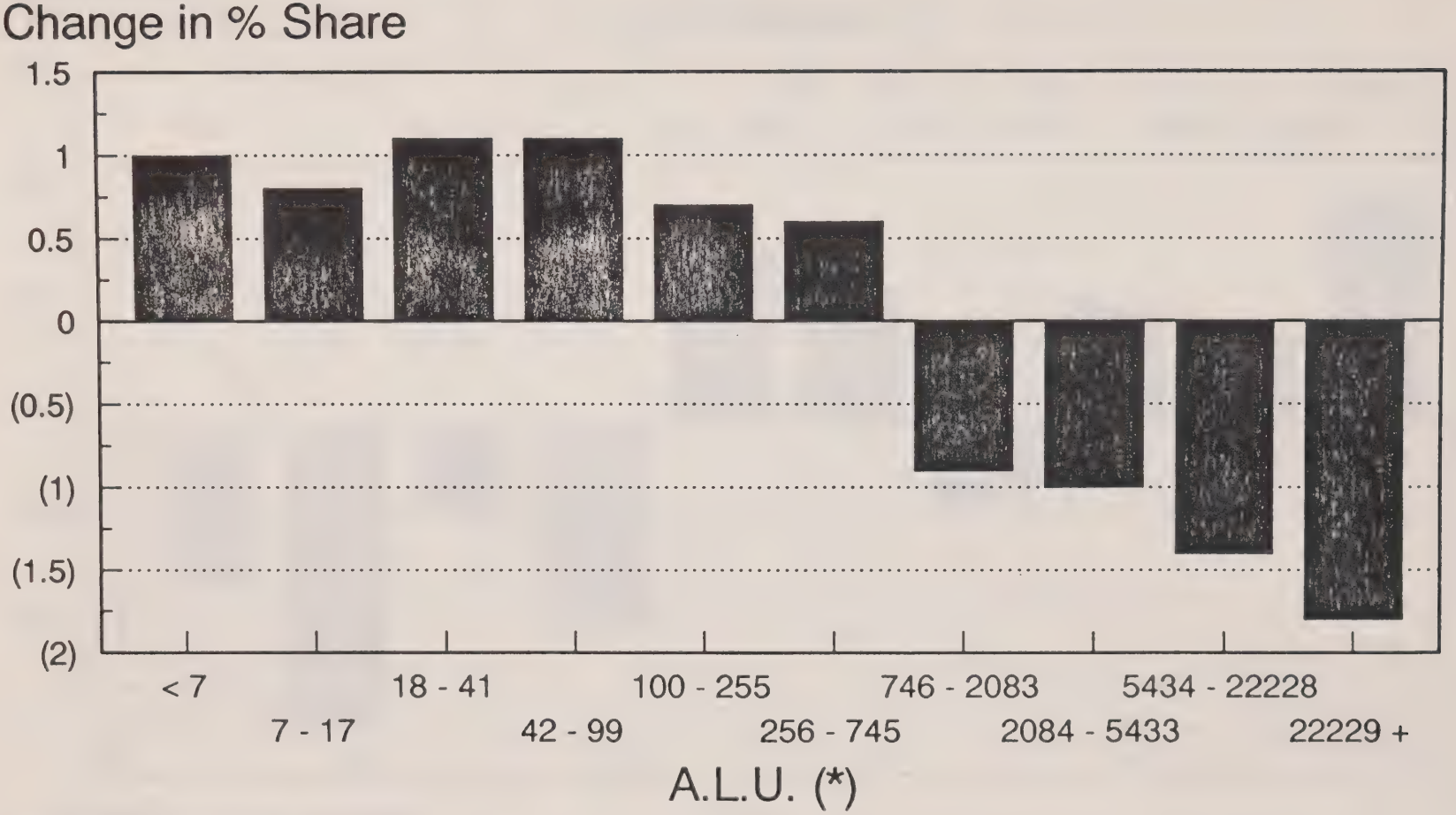
CHART 3. CHANGE IN THE DISTRIBUTION OF PRIVATE SECTOR EMPLOYMENT, BY COMPANY SIZE, 1983-88



Source: SEPH.

* September employment levels.

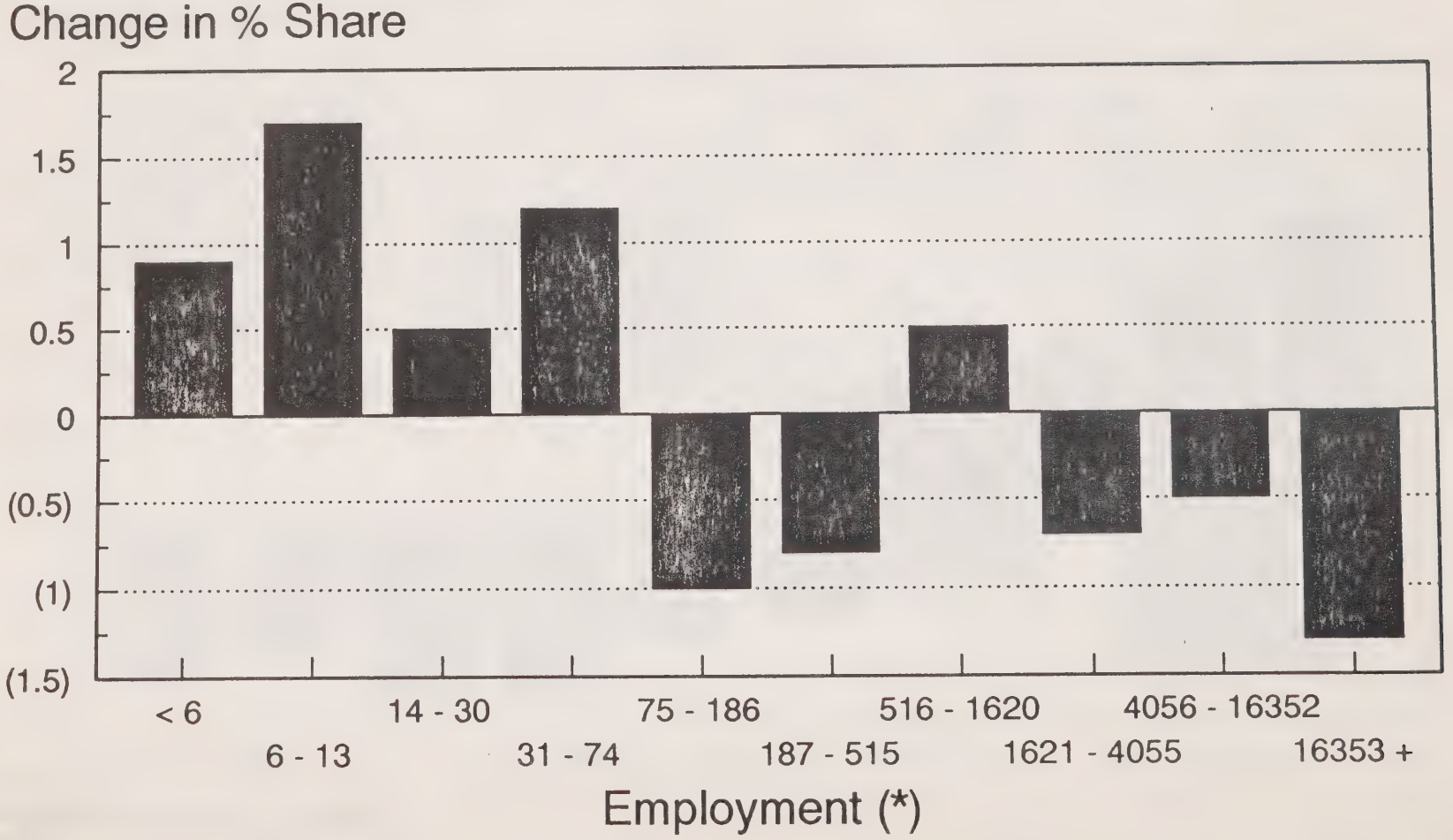
CHART 4. CHANGE IN THE DISTRIBUTION OF PRIVATE SECTOR EMPLOYMENT, BY COMPANY SIZE, 1978-88



Source: LEAP database.

* - estimate of company employment based on payroll and industry.

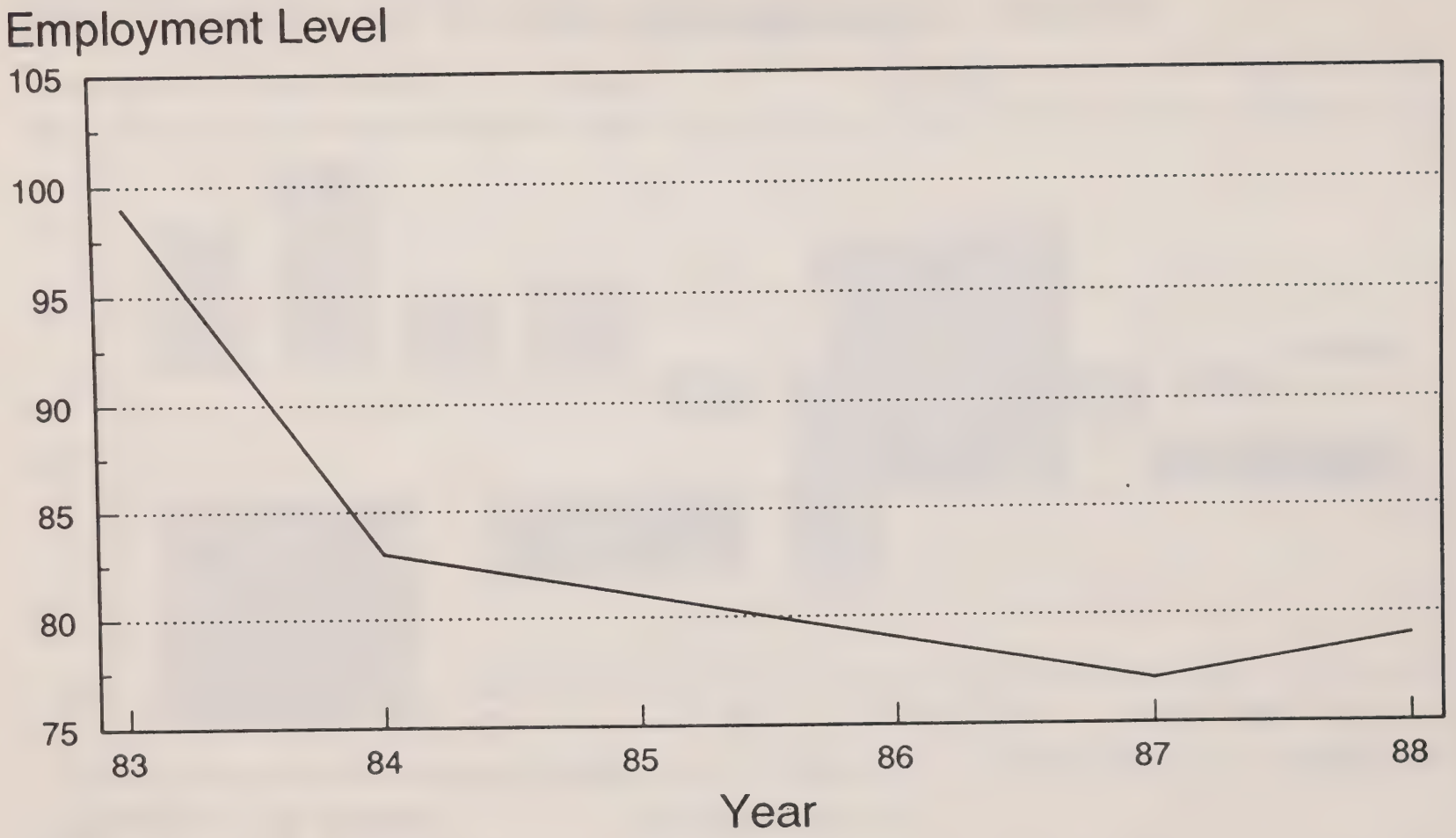
CHART 5. CHANGE IN THE DISTRIBUTION OF PRIVATE SECTOR EMPLOYMENT, BY COMPANY SIZE, 1983-88



Source: SEPH.

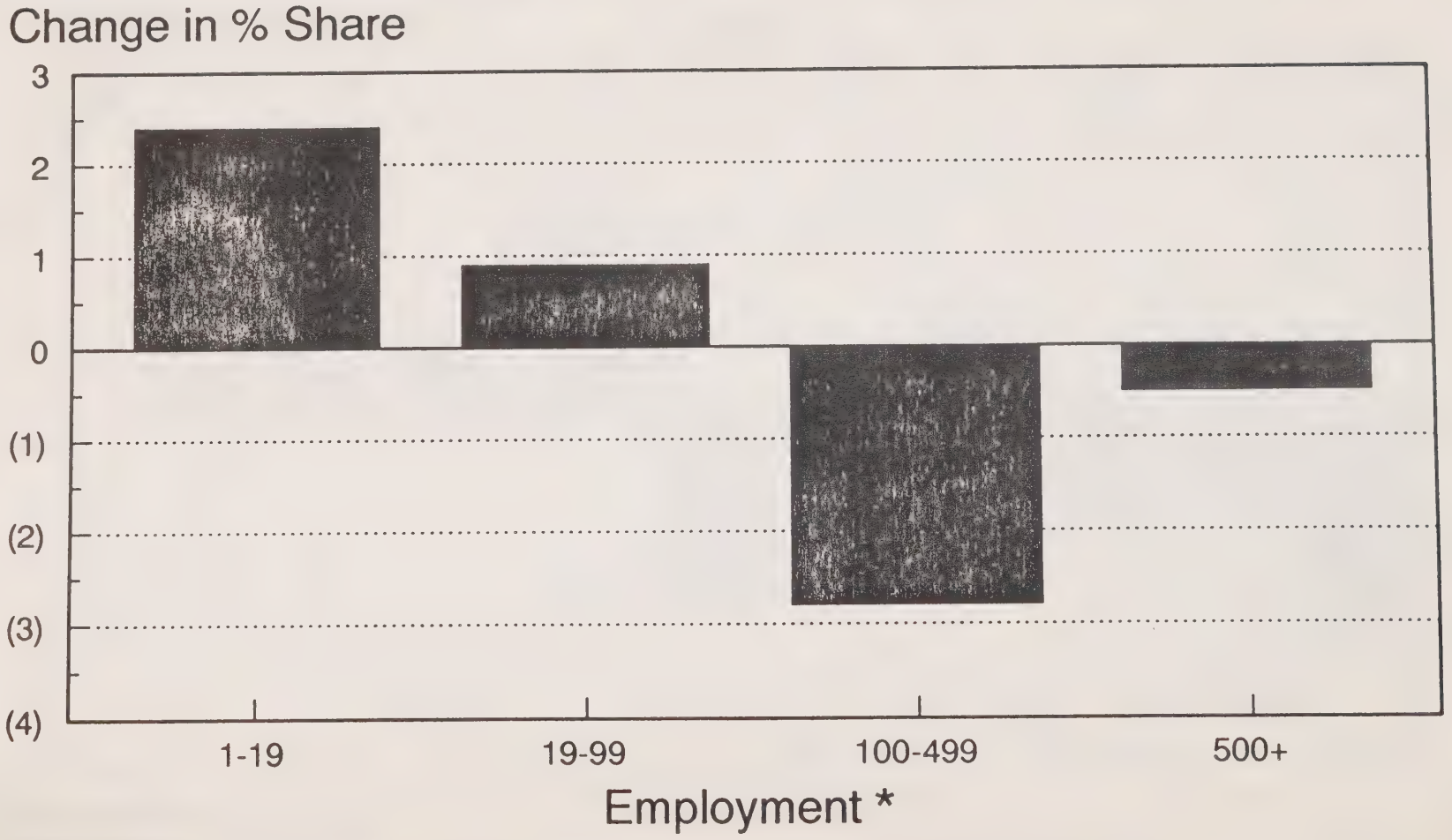
* September employment levels.

CHART 6. EMPLOYEE-WEIGHTED MEDIAN ESTABISHMENT SIZE, PRIVATE SECTOR, 1983-88



Source: Survey of Employment, Payroll and Hours.
Employers active in September of each year.

CHART 7. CHANGE IN THE DISTRIBUTION OF PRIVATE SECTOR EMPLOYMENT BY ESTABLISHMENT SIZE, 1983-88



Source: SEPH.

* September employment levels.

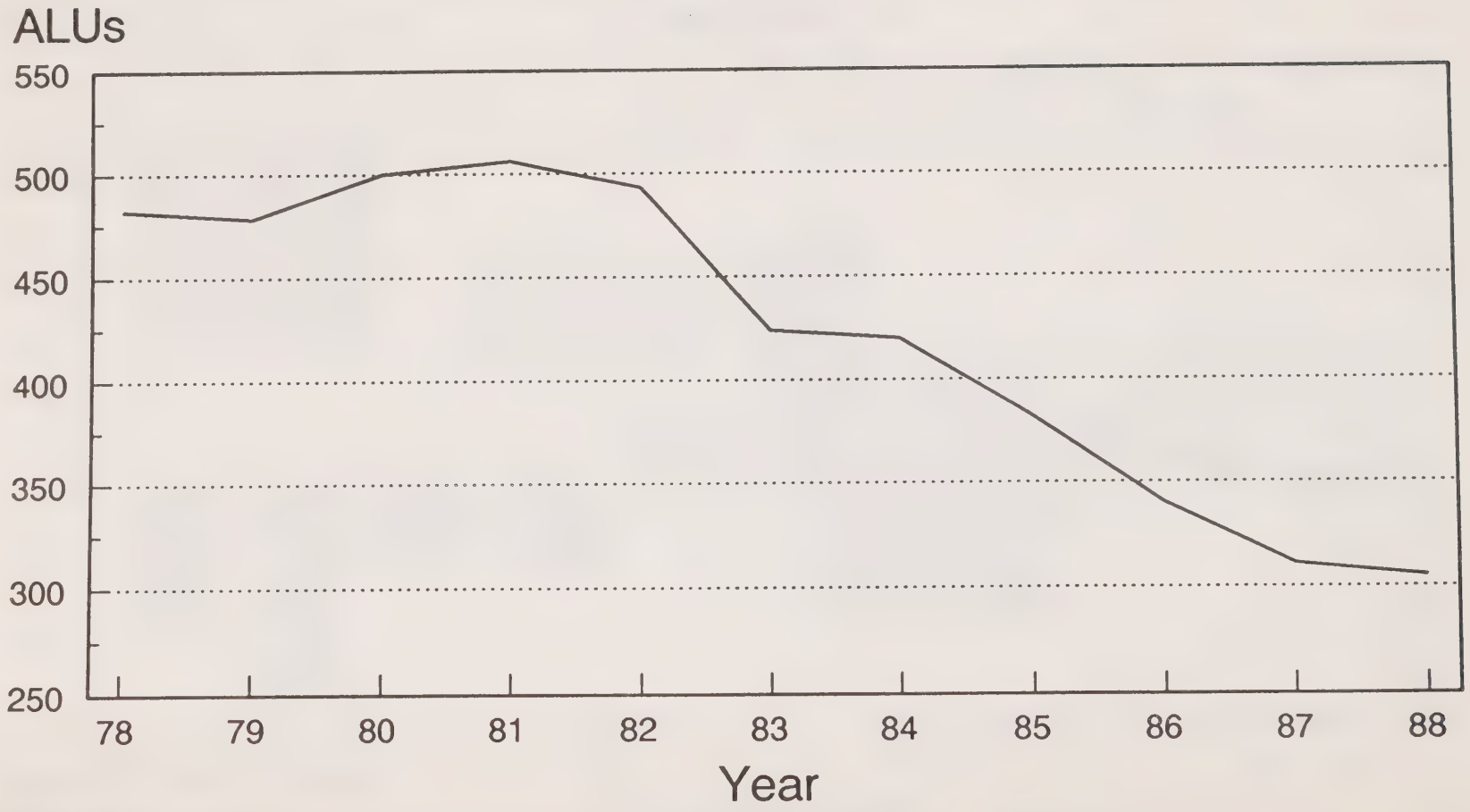
CHART 8.

CHANGE IN THE DISTRIBUTION OF PRIVATE SECTOR EMPLOYMENT, BY ESTABLISHMENT SIZE, 1983-88

Source: SEPH.

* September employment levels.

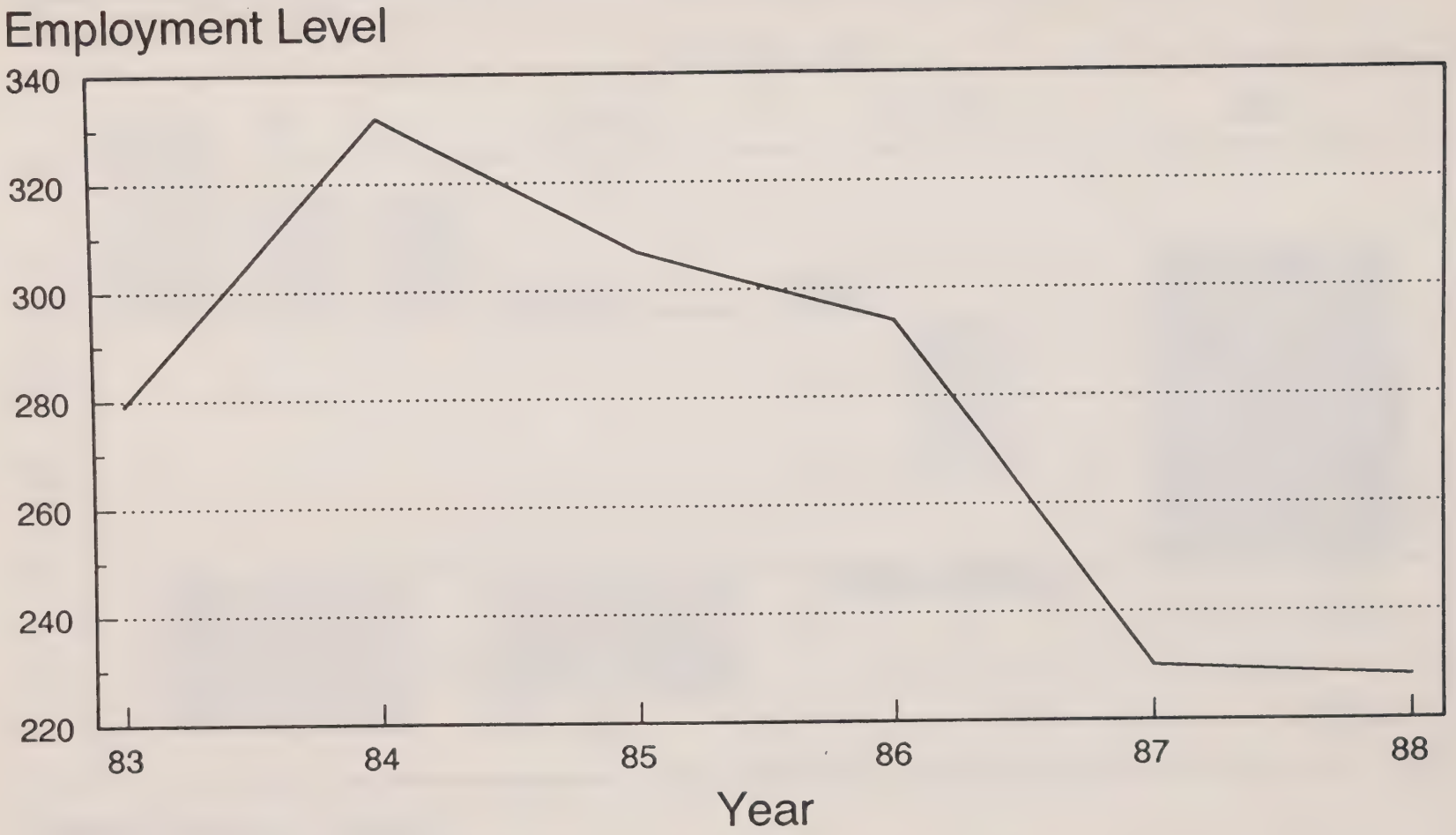
CHART 9. EMPLOYEE-WEIGHTED MEDIAN COMPANY SIZE GOODS-PRODUCING SECTOR, 1978-88



Source: LEAP database.

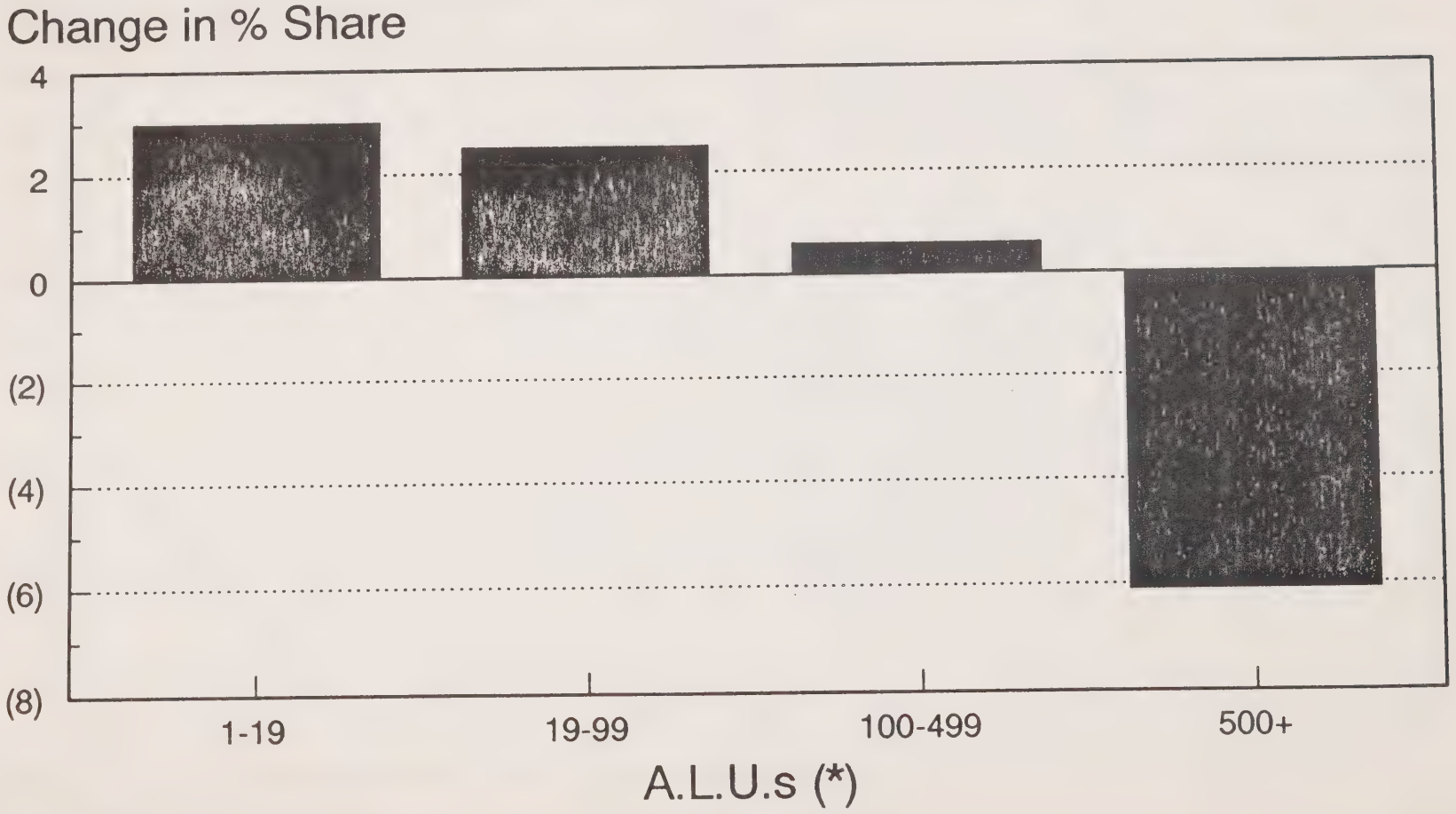
* - estimated company employment based on payroll and industry

CHART 10. EMPLOYEE-WEIGHTED MEDIAN COMPANY SIZE GOODS-PRODUCING SECTOR, 1983-88



Source: Survey of Employment, Payroll and Hours.
Employers active in September of each year.

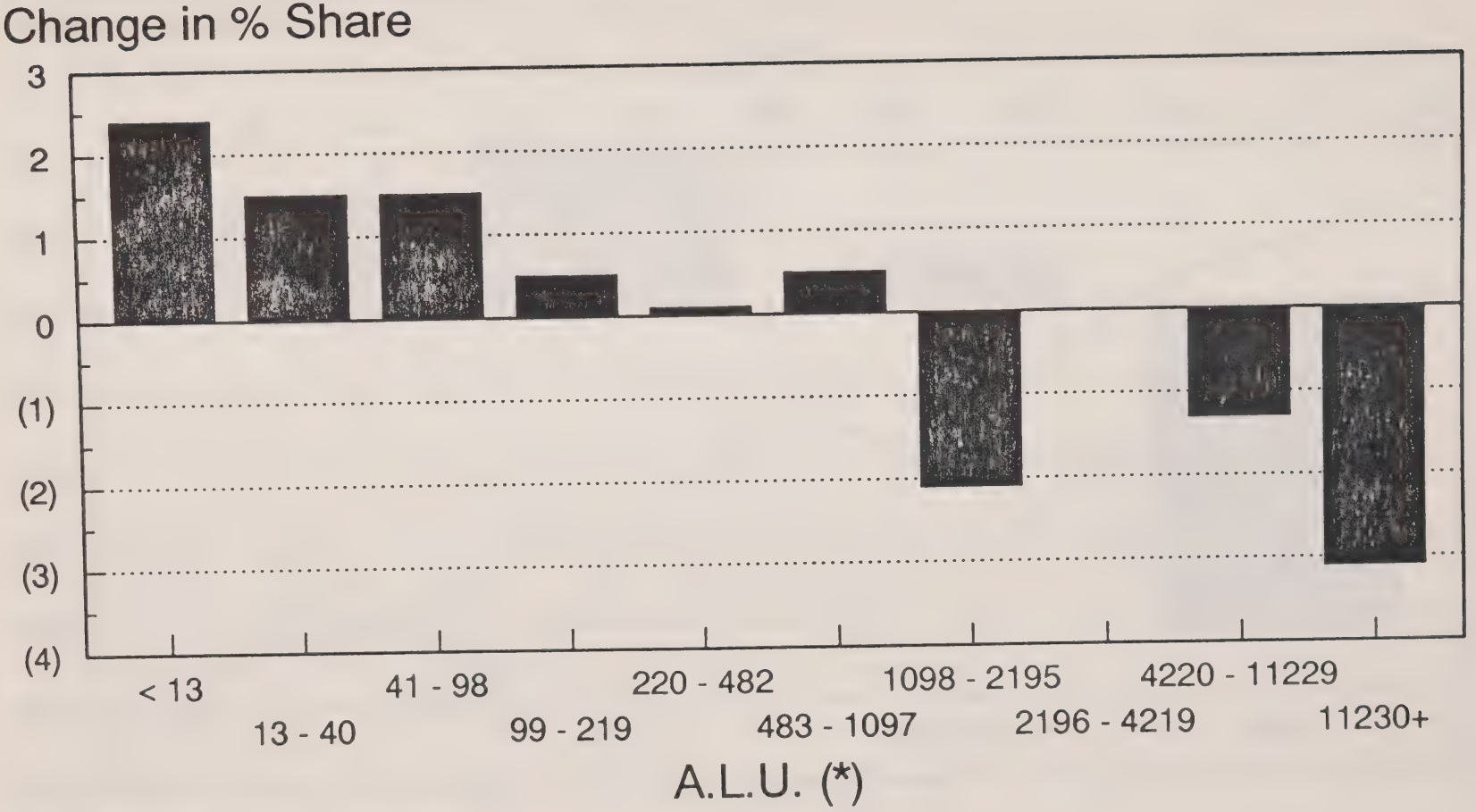
CHART 11. CHANGE IN THE DISTRIBUTION OF GOODS-PRODUCING EMPLOYMENT, BY COMPANY SIZE, 1978-88



Source: LEAP.

* - estimated company employment based on payroll and industry.

CHART 12. CHANGE IN THE DISTRIBUTION OF GOODS-PRODUCING EMPLOYMENT, BY COMPANY SIZE, 1978-88



Source: LEAP database.

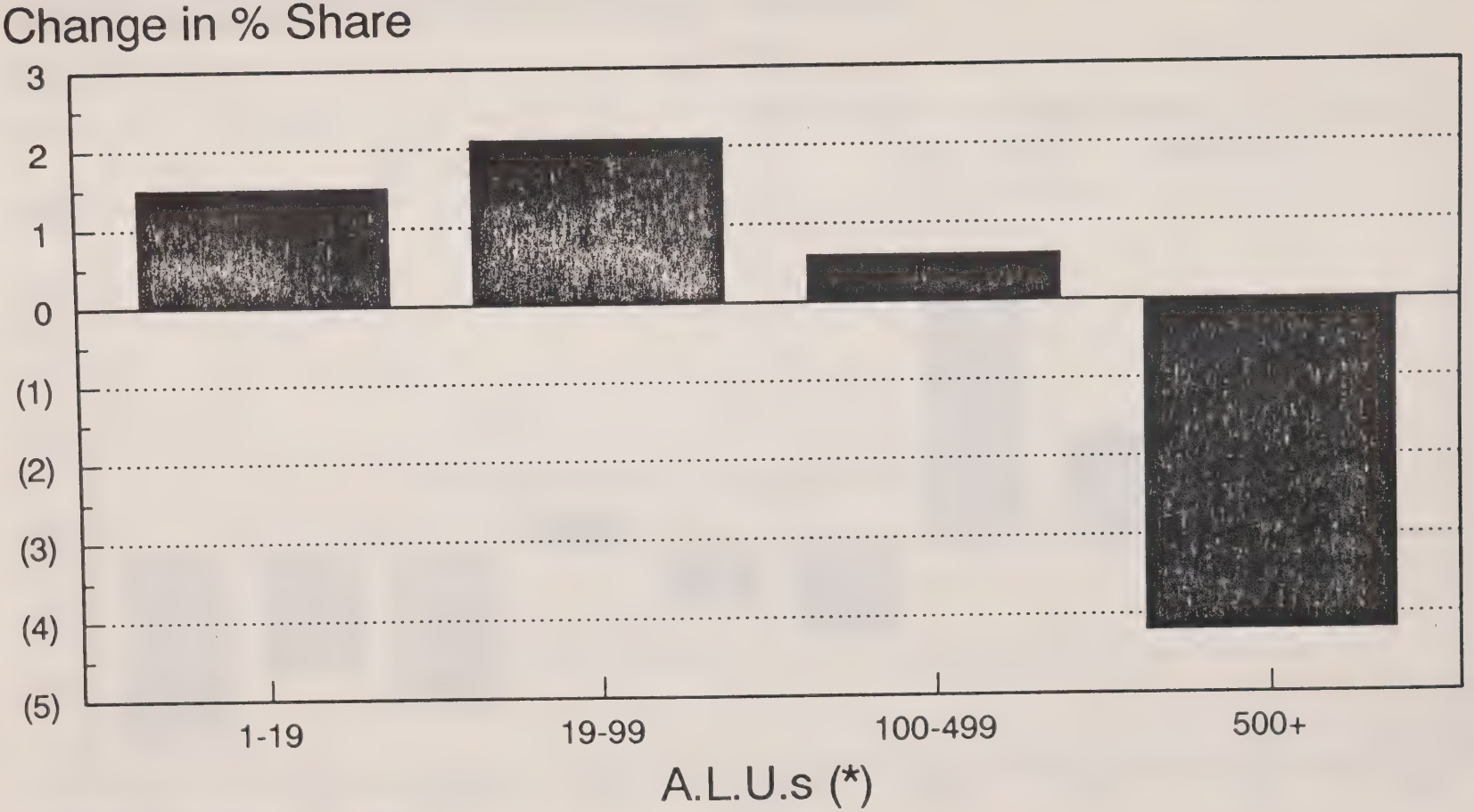
* - estimated company employment based on payroll and industry.

CHART 13. EMPLOYEE-WEIGHTED MEDIAN COMPANY SIZE MANUFACTURING INDUSTRIES, 1978-88

Source: LEAP database.

* - estimated company employment based on payroll and industry.

CHART 14. CHANGE IN THE DISTRIBUTION OF MANUFACTURING EMPLOYMENT, BY COMPANY SIZE, 1978-88

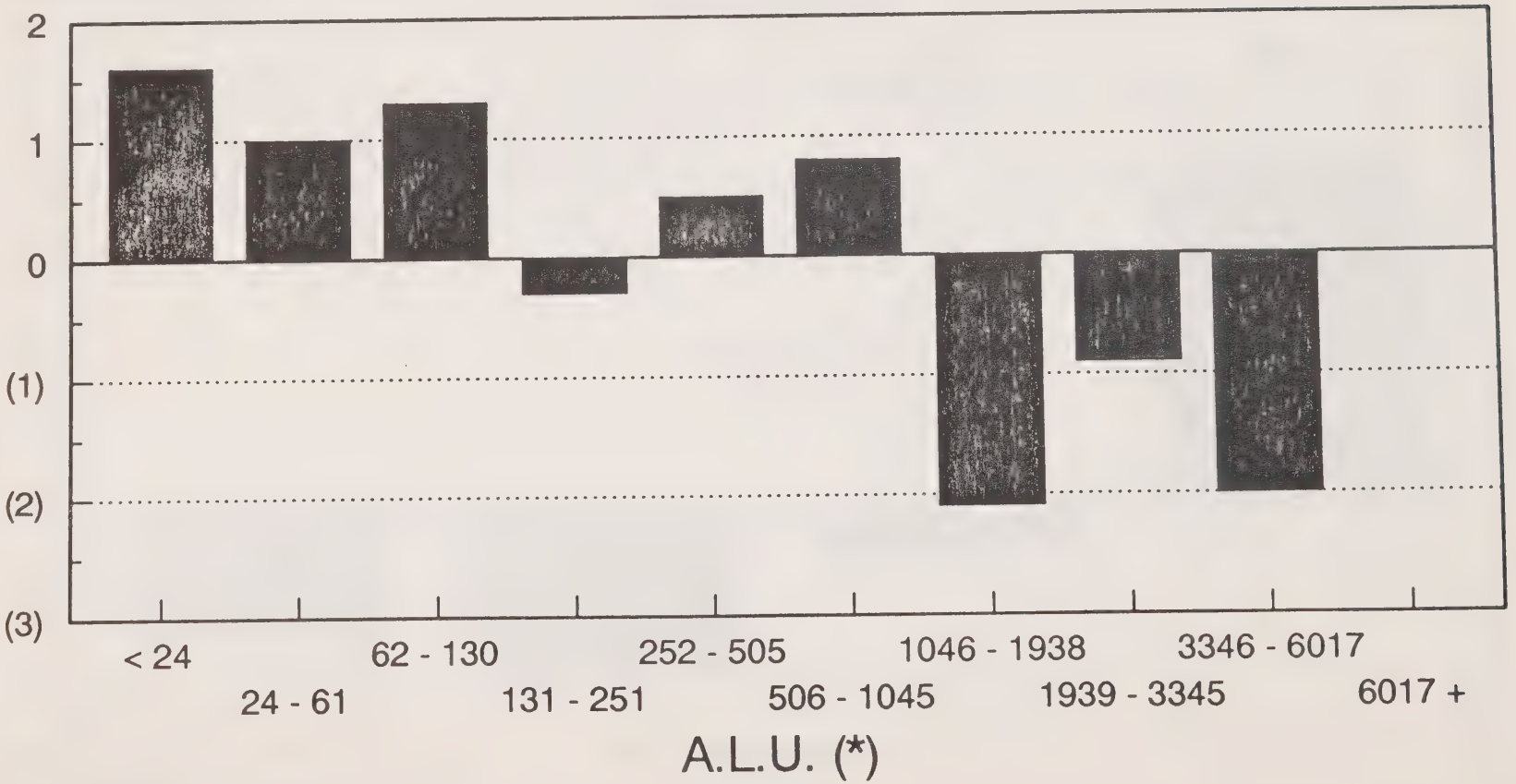


Source: LEAP database.

* - estimated company employment based on payroll and industry.

CHART 15. CHANGE IN THE DISTRIBUTION OF MANUFACTURING EMPLOYMENT, BY COMPANY SIZE, 1978-88

Change in % Share

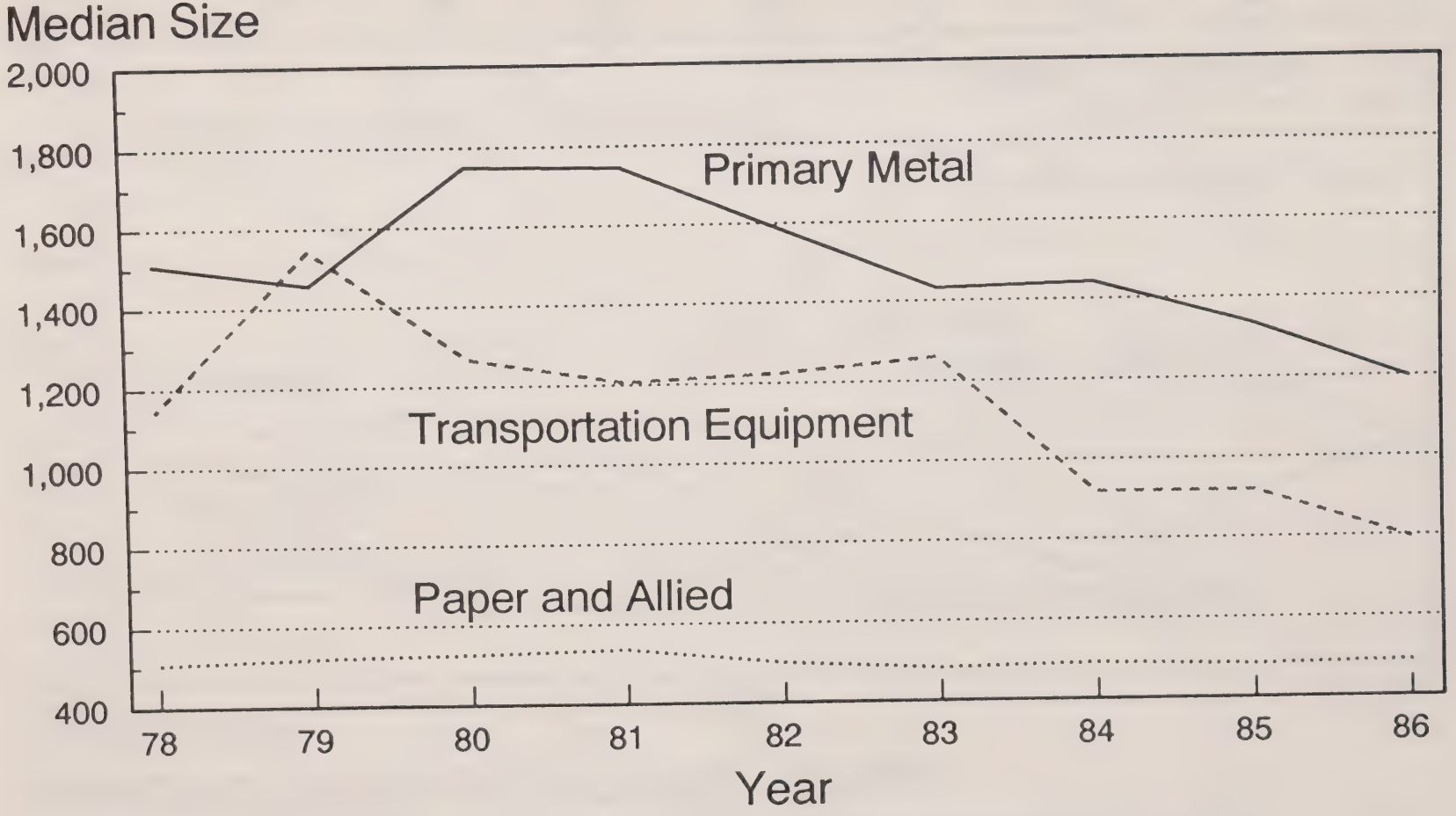


Source: LEAP database.

* - estimated company employment based on payroll and industry.

CHART 16A.

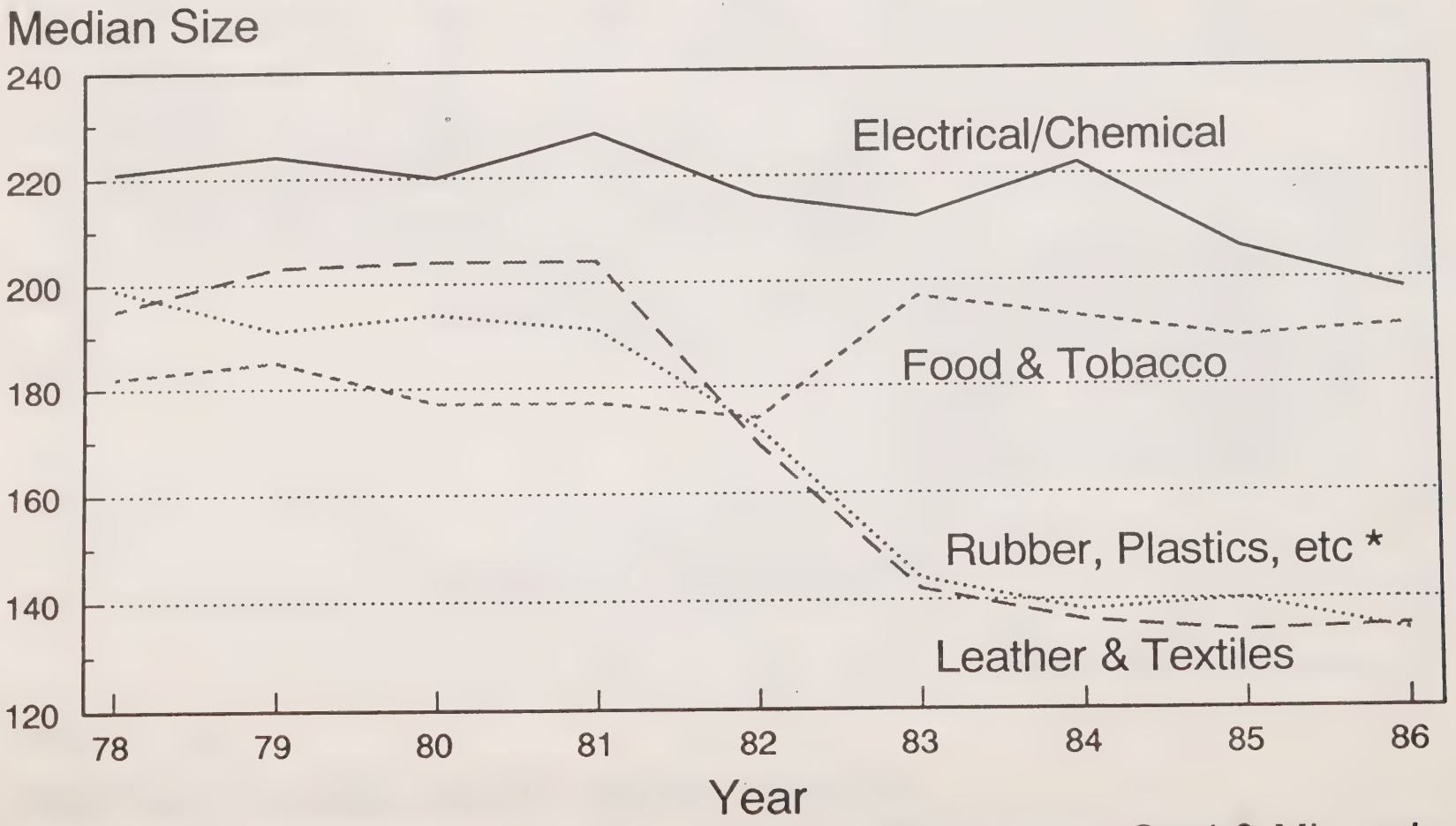
EMPLOYEE-WEIGHTED MEDIAN ESTABLISHMENT SIZE MANUFACTURING INDUSTRIES, 1978-86



Source: Census of Manufacturing.

CHART 16B.

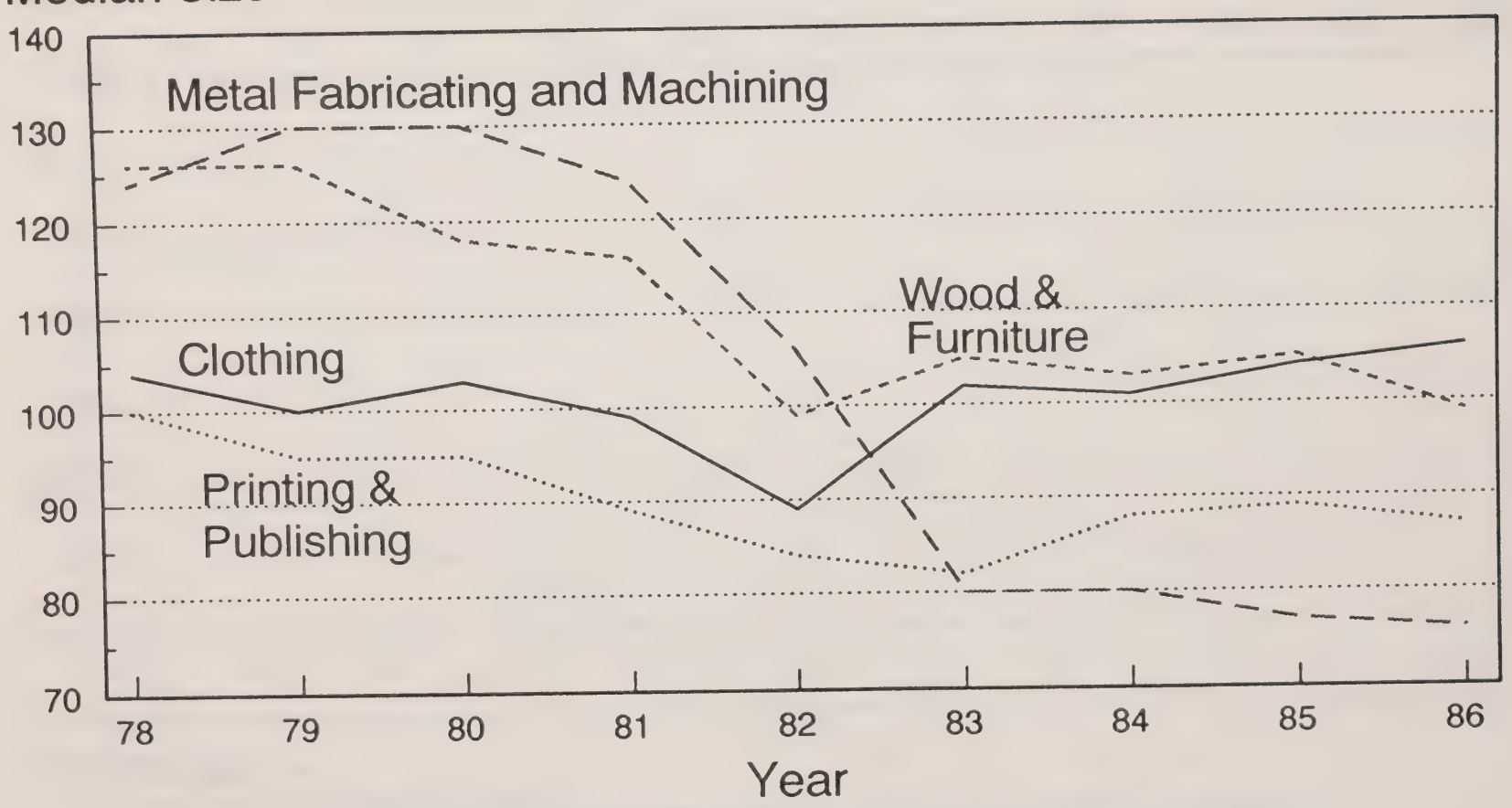
EMPLOYEE-WEIGHTED MEDIAN ESTABLISHMENT SIZE MANUFACTURING INDUSTRIES, 1978-86



Source: Census of Manufacturing.

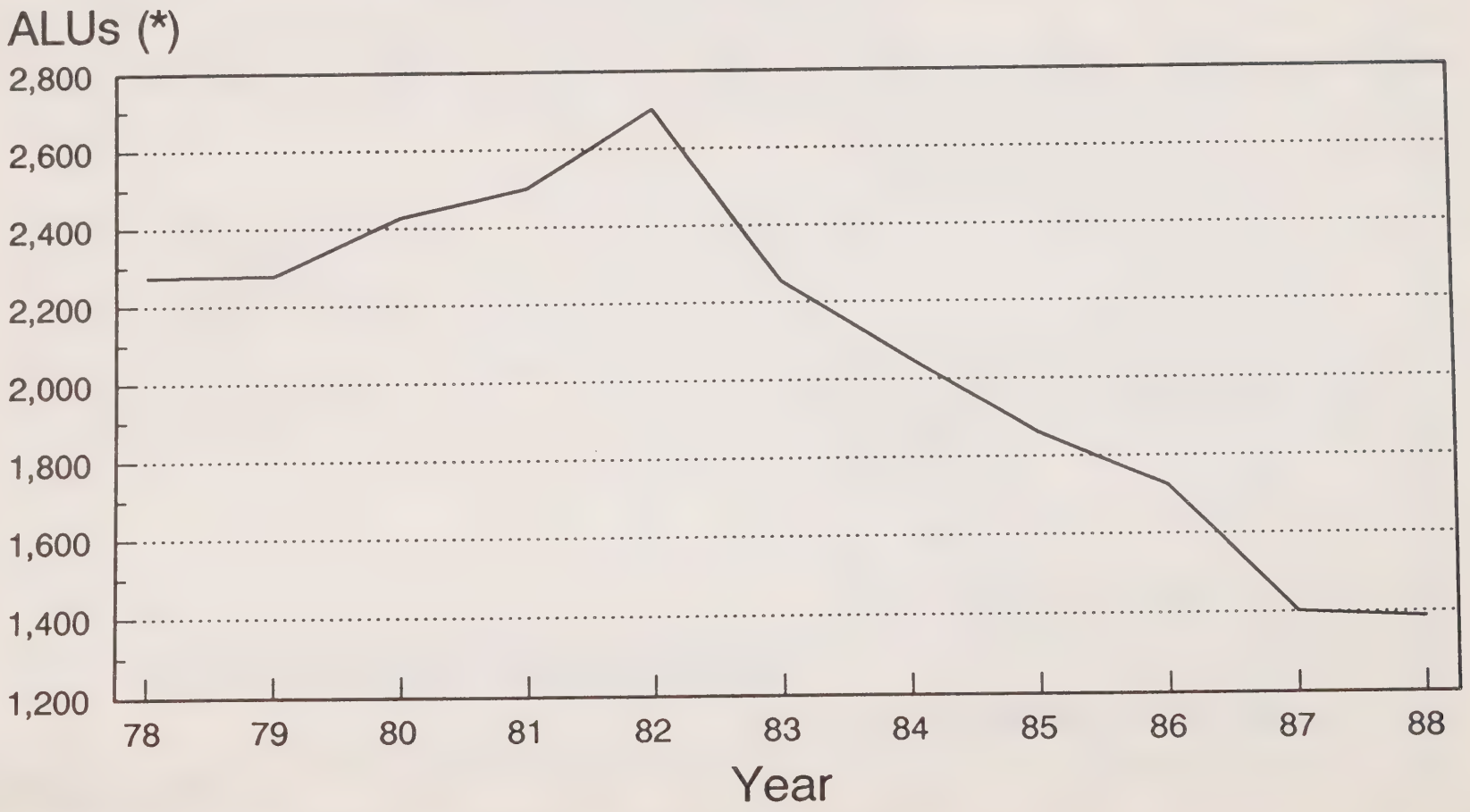
CHART 16C.

EMPLOYEE-WEIGHTED MEDIAN ESTABLISHMENT SIZE MANUFACTURING INDUSTRIES, 1978-86



Source: Census of Manufacturing.

CHART 17. EMPLOYEE-WEIGHTED MEDIAN COMPANY SIZE NATURAL RESOURCE INDUSTRIES, 1978-88



Source: LEAP database.

* - estimated company employment based on payroll and industry.

CHART 18. EMPLOYEE-WEIGHTED MEDIAN COMPANY SIZE CONSTRUCTION INDUSTRIES, 1978-88

Source: LEAP database.

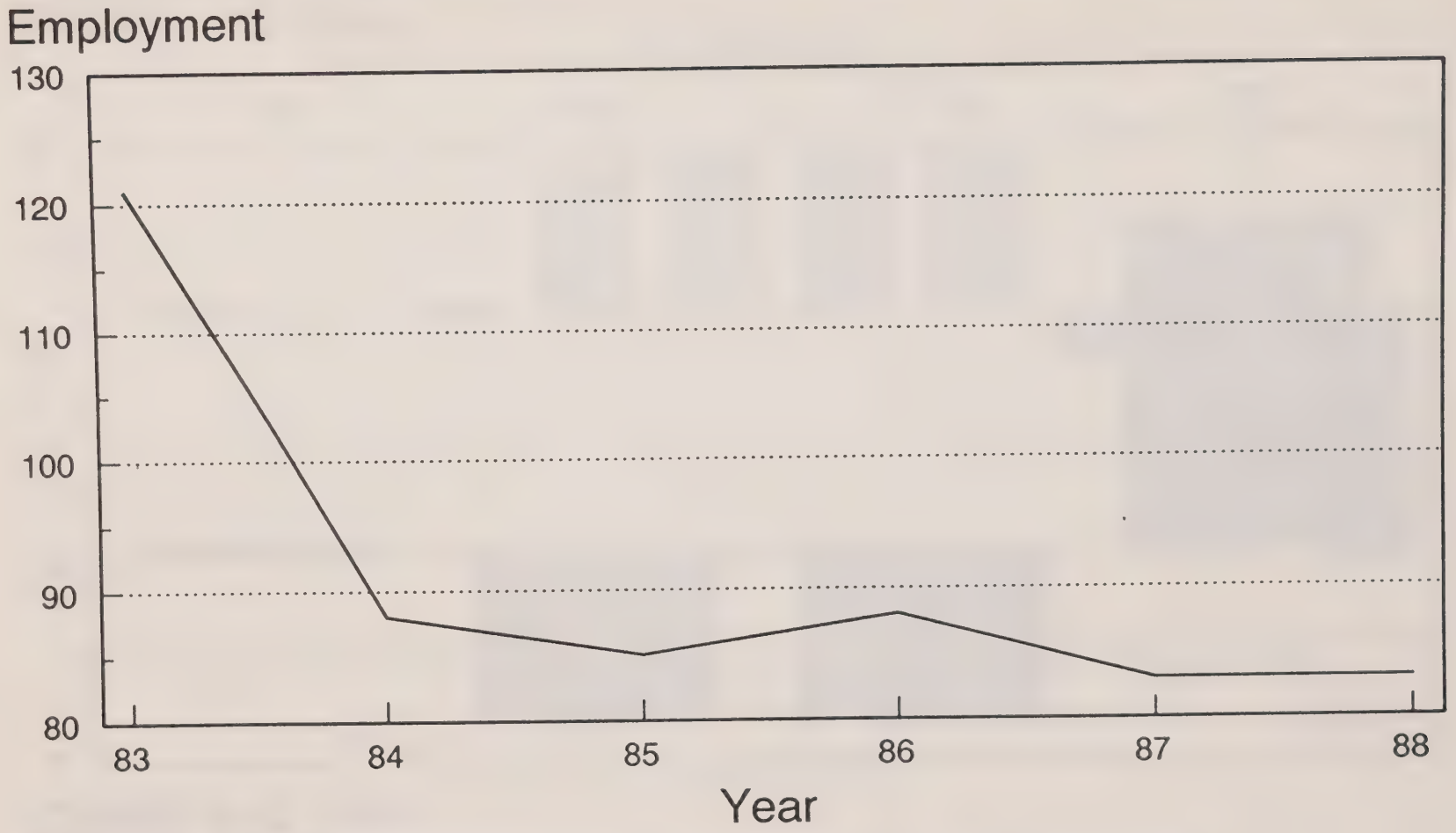
* - estimated company employment based on payroll and industry.

CHART 19. EMPLOYEE-WEIGHTED MEDIAN COMPANY SIZE PRIVATE SECTOR SERVICES, 1978-88

Source: LEAP database.

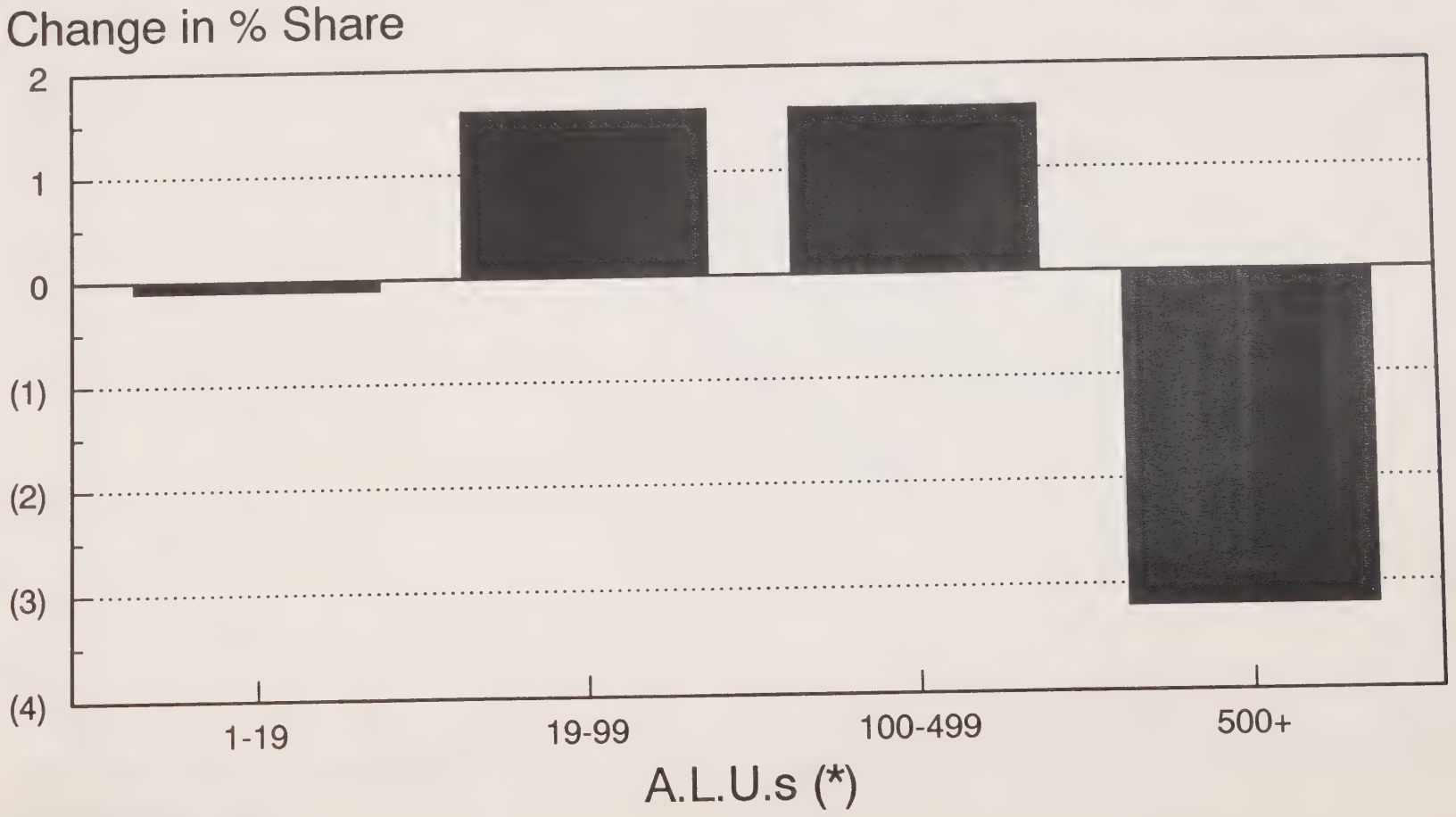
* - estimated company employment based on payroll and industry.

CHART 20. EMPLOYEE-WEIGHTED MEDIAN COMPANY SIZE PRIVATE SECTOR SERVICES, 1983-88



Source: Survey of Employment, Payroll and Hours.
Employers active in September of each year.

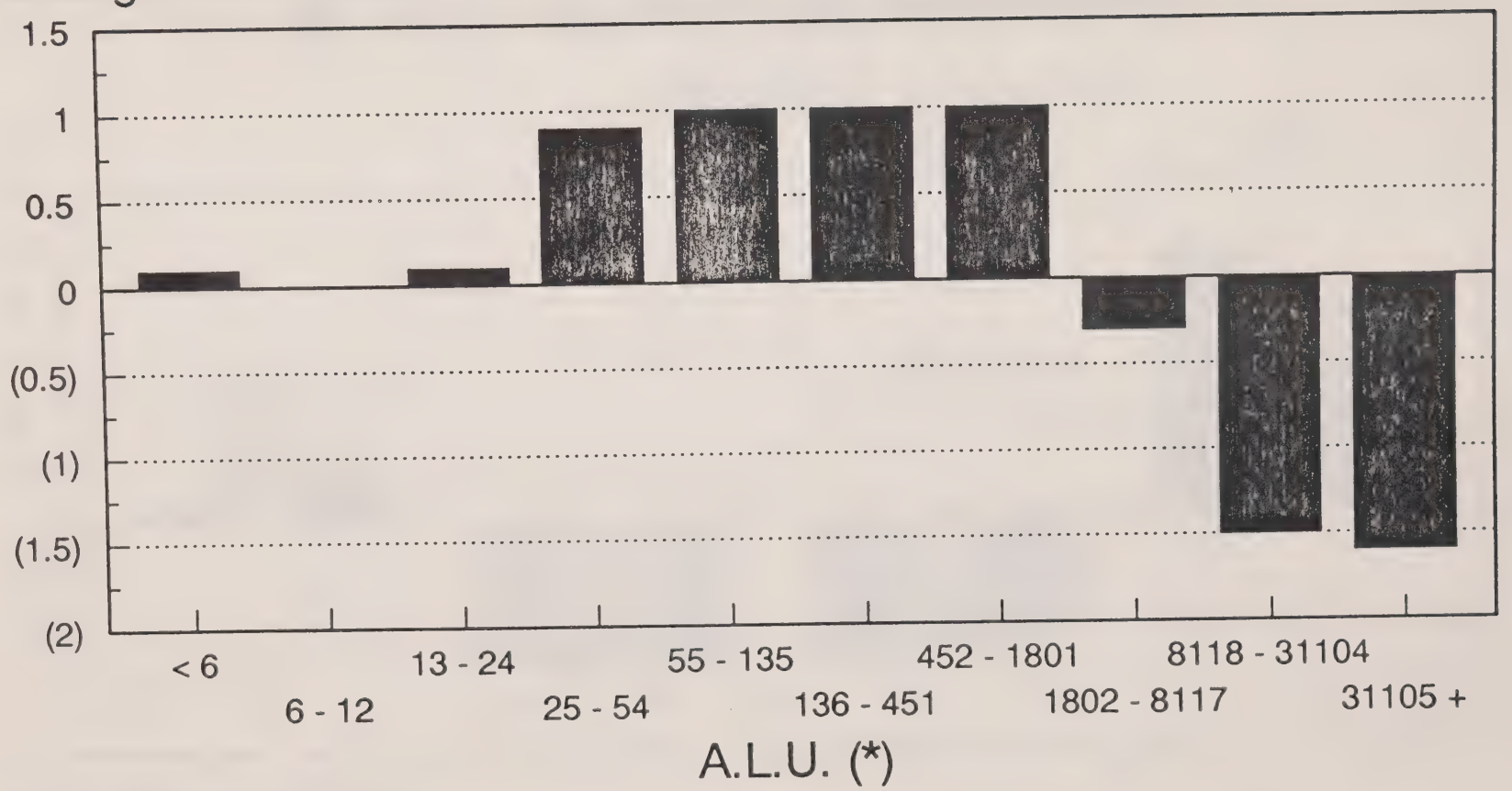
CHART 21. CHANGE IN THE DISTRIBUTION OF SERVICE SECTOR EMPLOYMENT, BY COMPANY SIZE, 1978-88



Source: LEAP.

* - estimated company employment based on payroll and industry.

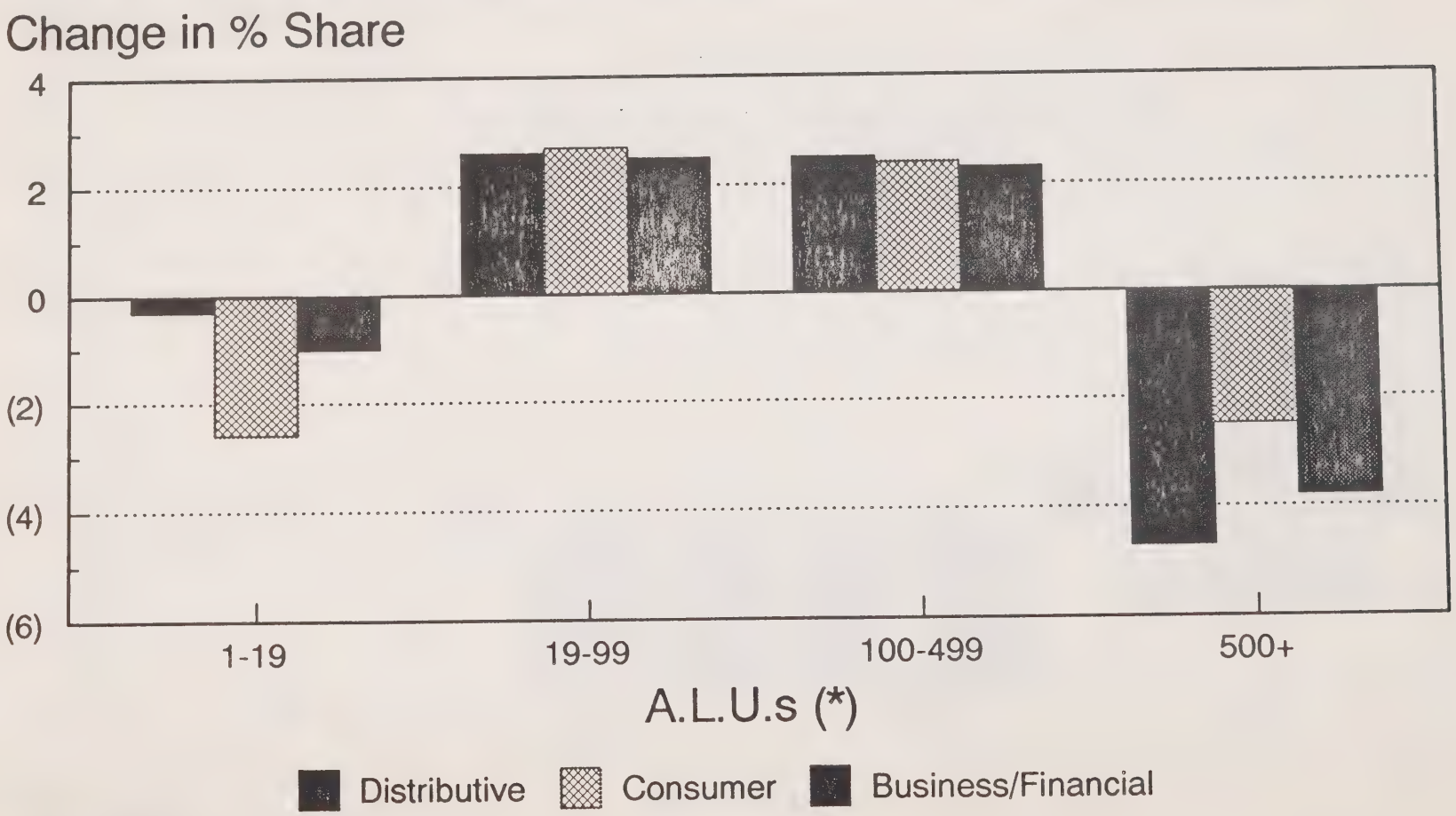
CHART 22. CHANGE IN THE DISTRIBUTION OF SERVICE SECTOR EMPLOYMENT, BY COMPANY SIZE, 1978-88



Source: LEAP database.

* - estimated company employment based on payroll and industry.

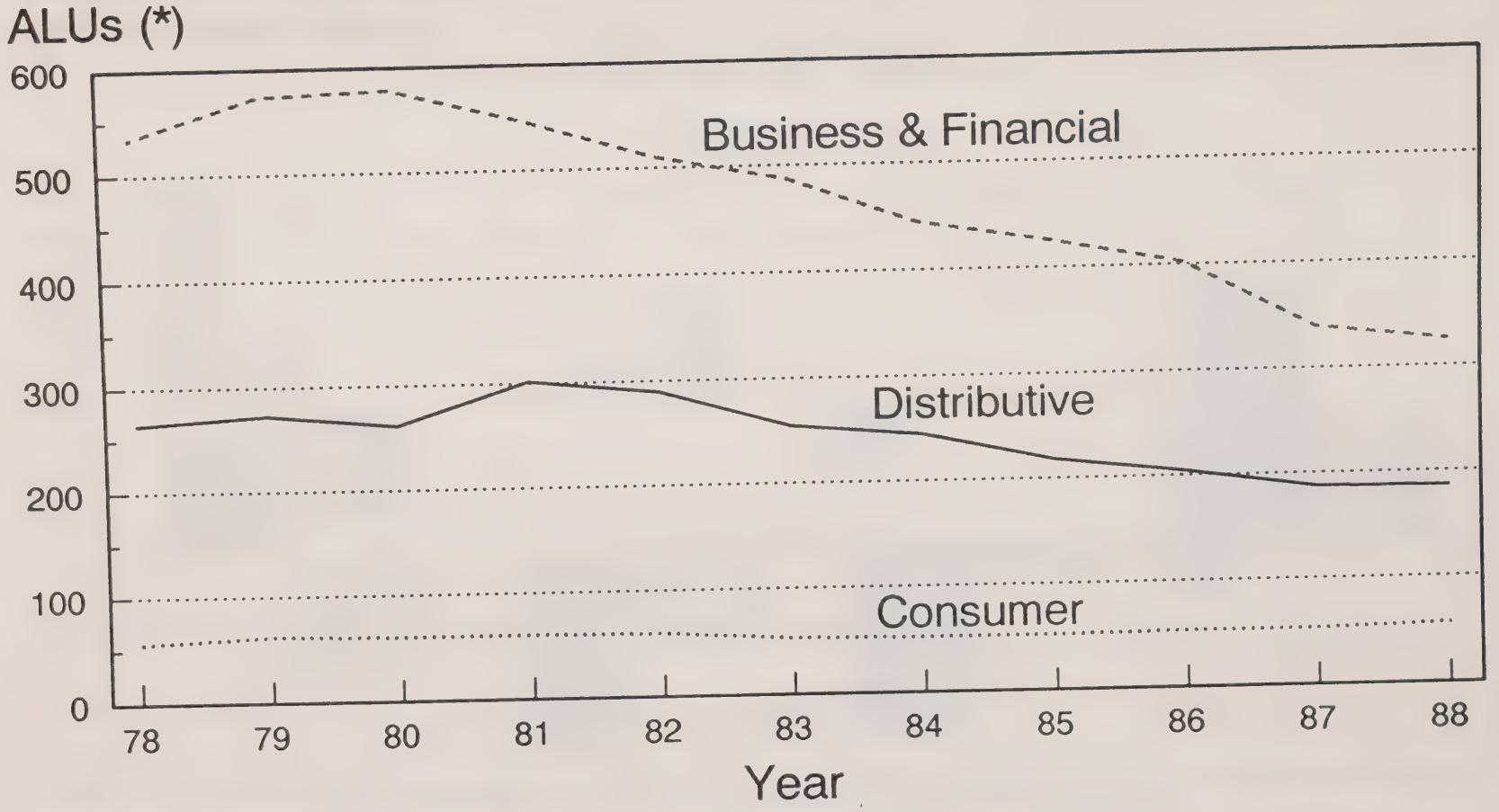
CHART 23. CHANGE IN THE DISTRIBUTION OF SERVICE SUB-SECTOR EMPLOYMENT, BY COMPANY SIZE, 1978-88



Source: LEAP.

* - estimated company employment based on payroll and industry.

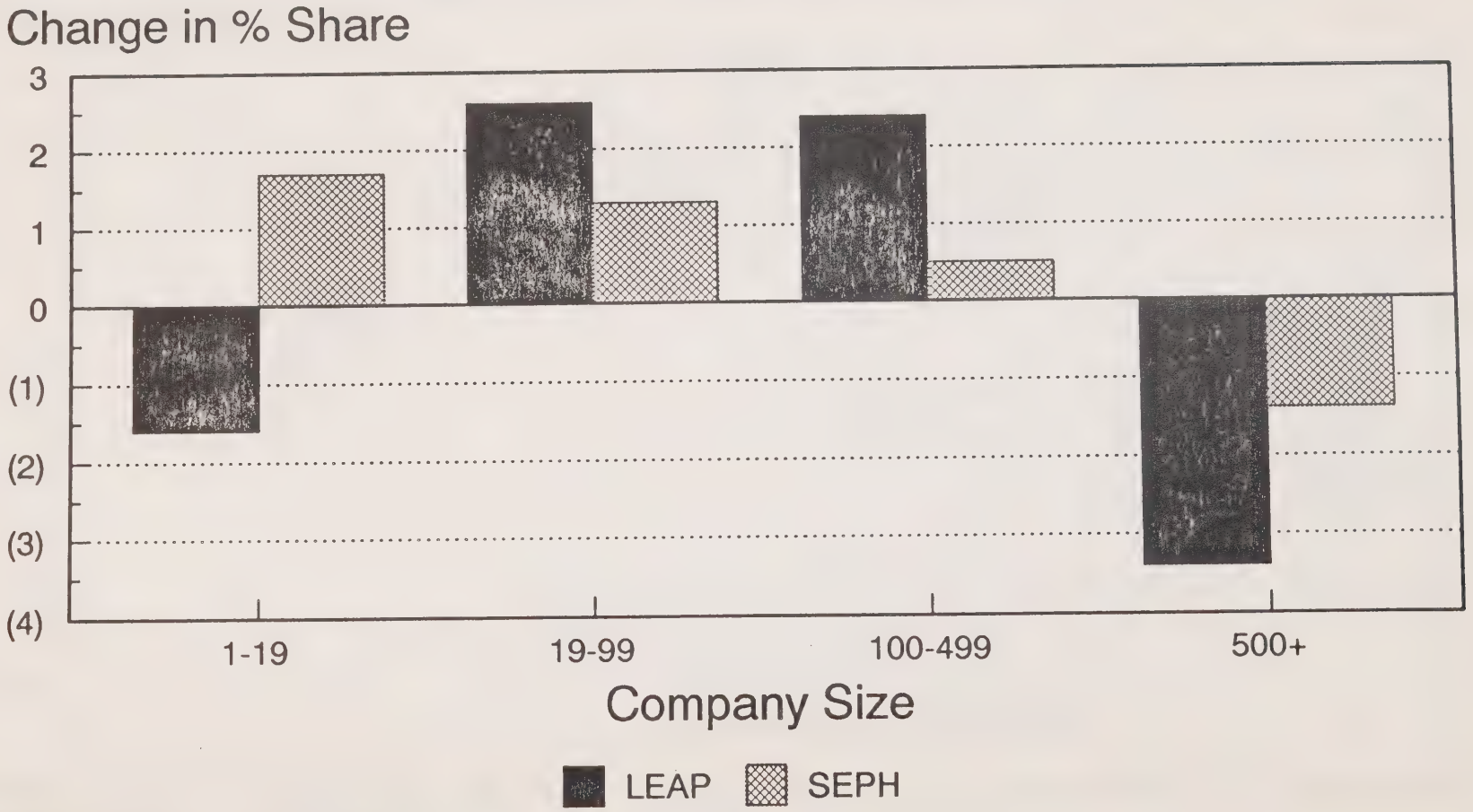
CHART 24. EMPLOYEE-WEIGHTED MEDIAN COMPANY SIZE SERVICES SUB-SECTORS, 1978-88



Source: LEAP database.

* - estimated company employment based on payroll and industry.

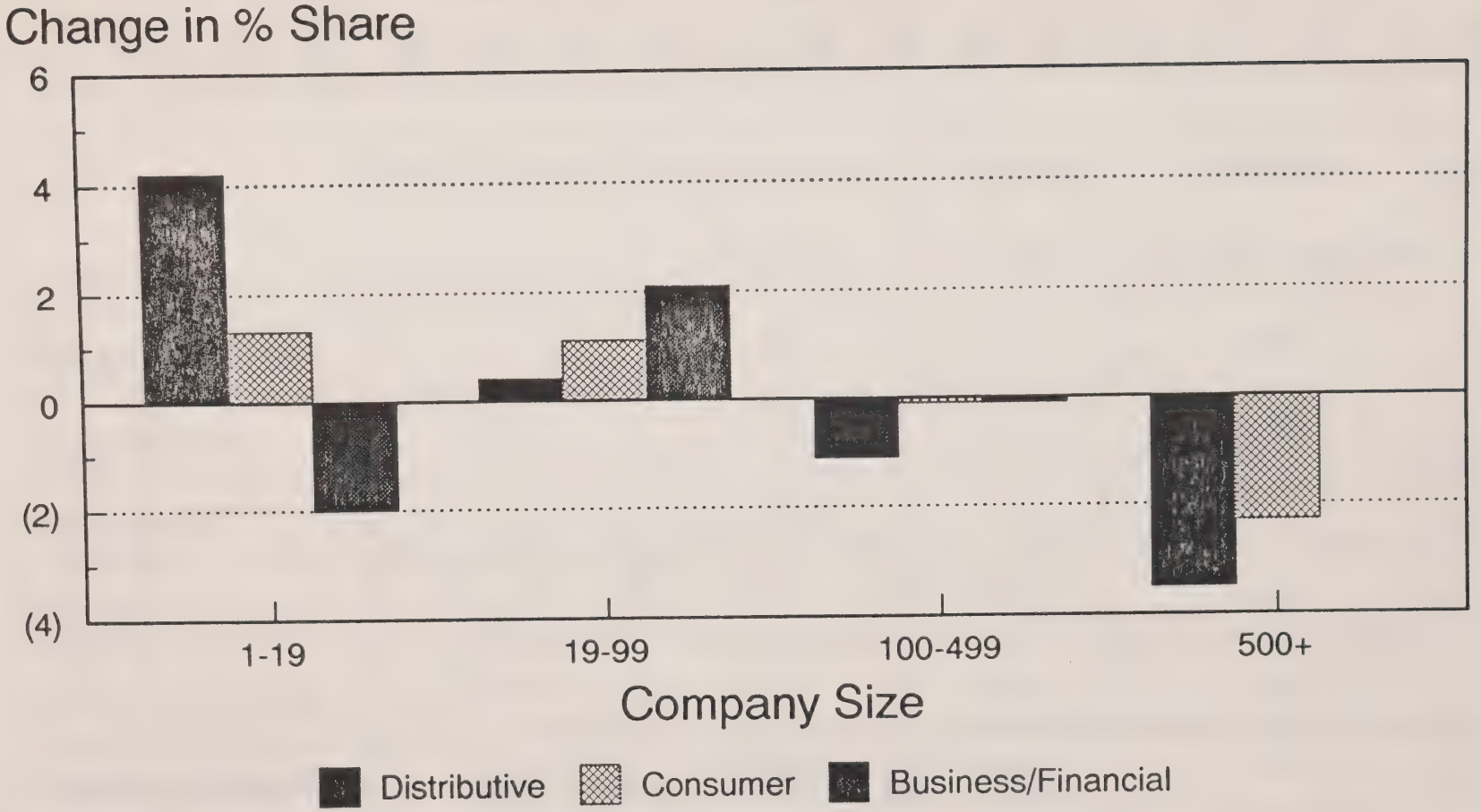
CHART 25. CHANGE IN THE DISTRIBUTION OF SERVICE SECTOR EMPLOYMENT, BY COMPANY SIZE, 1983-88



Source: LEAP database and SEPH.

* - LEAP estimates and SEPH September employment.

CHART 26. CHANGE IN THE DISTRIBUTION OF SERVICE SUB-SECTOR EMPLOYMENT, BY COMPANY SIZE, 1983-88

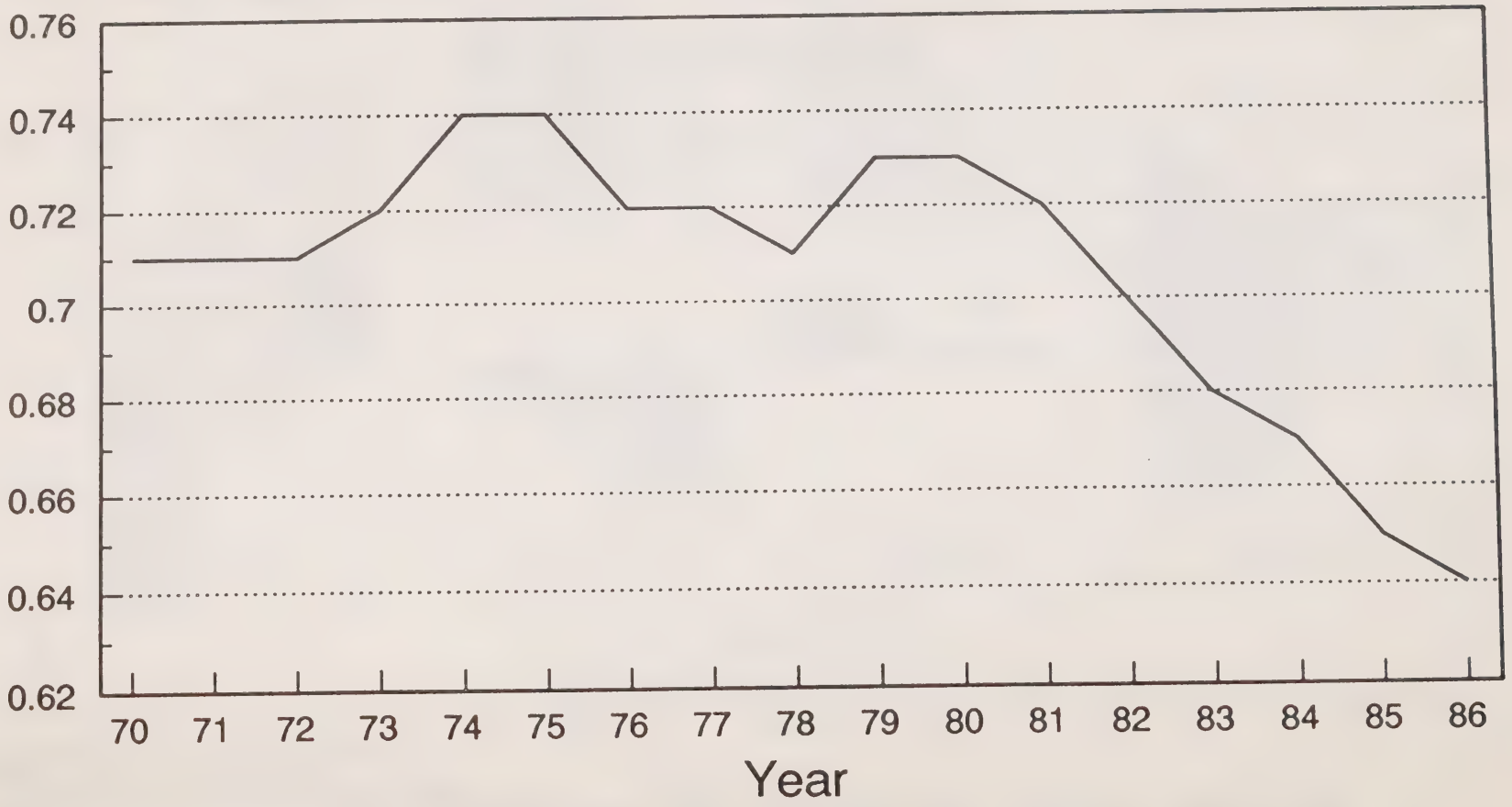


Source: SEPH.

CHART 27.

RATIO OF AVERAGE EARNINGS: SMALL TO LARGE MANUFACTURING ESTABLISHMENTS, 1970-86

Ave Earnings Est. <100 / Ave Earnings Est. >500



Source: Census of Manufacturing.

TABLE 1. EMPLOYMENT GROWTH AND COMPANY SIZE BY INDUSTRY, 1978-88

	Employment * 1978 ('000)	Employment * 1988 ('000)	% Change 1978-88	E-Median Company Size 1978
Natural Resources	712	791	11.2	2,276
Manufacturing	1,449	1,746	20.5	506
Construction	406	588	44.9	32
Distributive Serv.	1,096	1,311	19.6	264
Consumer Services	2,118	2,770	30.8	56
Business & Financial	1,137	1,538	35.2	533

Source: LEAP database.

* - employment estimates based on payroll and industry.

TABLE 2. DECOMPOSING THE CHANGE IN THE COMPANY SIZE DISTRIBUTION BY INDUSTRY, 1978-88

	Change in % Share 1978-88	Between-Industries Component (%)	Within-Industries Component (%)	Interaction Component (%)
< 7	1.0	60	32	7
7 - 17	0.8	59	34	7
18 - 41	1.1	25	75	0
42 - 99	1.1	4	93	3
100 - 255	0.7	18	78	4
256 - 745	0.6	28	71	1
746 - 2083	(0.9)	42	57	1
2084 - 5433	(1.0)	50	48	2
5434 - 22228	(1.4)	21	77	2
22229 +	(1.8)	8	86	6
Weighted Average		33	64	3

Source: LEAP database.

* - employment estimates based on payroll and industry.

TABLE 3. DECOMPOSITION OF THE CHANGE IN AVERAGE WEEKLY SALARY BY COMPANY SIZE, PRIVATE SECTOR, 1983-88

Company Size	Average Salary $ 1983		Size Distribution		Decomposition Components $ 1983		
	1983 a	1988 b	1983 c	1988 d	Earnings (b-a)*c	Size (d-c)*a	Interaction (b-a)*(d-c)
< 6	261	265	0.091	0.101	0.30	2.63	0.03
6 - 13	288	278	0.100	0.117	-0.97	4.98	-0.17
14 - 30	310	315	0.107	0.111	0.52	1.27	0.02
31 - 74	345	332	0.101	0.114	-1.36	4.51	-0.18
75 - 186	373	365	0.101	0.090	-0.76	-3.91	0.08
187 - 515	408	398	0.100	0.092	-1.02	-3.41	0.09
516 - 1620	437	420	0.100	0.105	-1.70	2.14	-0.08
1621 - 4055	453	435	0.100	0.096	-1.82	-1.66	0.07
4056 - 16352	491	476	0.099	0.089	-1.48	-4.66	0.14
16353 +	436	418	0.101	0.084	-1.78	-7.58	0.31
Total	381	365	1.000	1.000	-10.06	-5.71	0.31

Source: Survey of Employment, Payroll and Hours.

TABLE 4. DECOMPOSITION OF THE CHANGE IN AVERAGE WEEKLY SALARY BY COMPANY SIZE, GOODS-PRODUCING SECTOR, 1983-88

Company Size	Average Salary $ 1983		Size Distribution		Decomposition Components $ 1983		
	1983 a	1988 b	1983 c	1988 d	Earnings (b-a)*c	Size (d-c)*a	Interaction (b-a)*(d-c)
< 11	352	342	0.096	0.119	-1.02	8.13	-0.25
11 - 31	400	398	0.104	0.127	-0.24	9.07	-0.05
32 - 76	405	410	0.098	0.107	0.55	3.68	0.05
77 - 164	427	421	0.100	0.097	-0.56	-1.61	0.02
165 - 309	434	444	0.102	0.081	1.02	-8.98	-0.21
310 - 670	467	474	0.100	0.094	0.70	-2.66	-0.04
671 - 1527	505	499	0.100	0.104	-0.59	2.35	-0.03
1528 - 2893	528	538	0.100	0.092	1.06	-4.39	-0.09
2894 - 8340	584	557	0.099	0.100	-2.63	0.65	-0.03
8341 +	616	669	0.101	0.079	5.38	-13.63	-1.18
Total	472	467	1.000	1.000	3.66	-7.38	-1.79

Source: Survey of Employment, Payroll and Hours.

TABLE 5. DECOMPOSITION OF THE CHANGE IN AVERAGE WEEKLY SALARY BY COMPANY SIZE, SERVICE SECTOR, 1983-88

Company Size	Average Salary $ 1983		Size Distribution		Decomposition Components $ 1983		
	1983 a	1988 b	1983 c	1988 d	Earnings (b-a)*c	Size (d-c)*a	Interaction (b-a)*(d-c)
< 5	241	246	0.094	0.098	0.53	0.92	0.02
5 - 9	250	248	0.099	0.110	-0.24	2.61	-0.03
10 - 19	265	253	0.107	0.109	-1.24	0.59	-0.03
20 - 40	286	287	0.098	0.106	0.13	2.30	0.01
41 - 95	315	297	0.102	0.106	-1.75	1.39	-0.08
96 - 315	341	325	0.101	0.094	-1.67	-2.41	0.12
316 - 1312	369	352	0.100	0.107	-1.65	2.79	-0.12
1313 - 4664	370	335	0.100	0.104	-3.52	1.40	-0.13
4665 - 22423	355	360	0.098	0.085	0.54	-4.51	-0.07
22424 +	418	372	0.103	0.082	-4.76	-8.58	0.95
Total	321	305	1.000	1.000	-13.64	-3.50	0.65

Source: Survey of Employment, Payroll and Hours.

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